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USDA Foreign Agricultural Service

Iraq: Crop Progress Report

MY 2010/11

March Summary

March 31, 2010

(1) The latest outlook for national winter grain production is favorable, given increased winter grain acreage and beneficial season-to-date rainfall conditions. Wheat and barley production are expected to recover to near-average levels, despite problems in irrigated production zones this year. Major rainfed crop zones in northern Iraq are expected to record bumper grain harvests this year, while major irrigated zones experience reduced production. Winter grain crops (wheat & barley) in southern Iraq have currently passed peak reproductive growth stage (flowering) and are in the important grain-filling stage. Crops in the northern provinces by comparison are in flowering stage, when moisture sensitivity is greatest. Iraqi provincial authorities indicate that national grain area has increased this year, but will not recover to near-normal levels owing to restrictions on irrigation availability in major central producing provinces. National wheat area, inclusive of the Kurdish regions, is estimated at 1.47 million hectares (up 23 % from last year), while barley area is estimated at 1.17 million hectares (up 134 % from last year). These initial acreage reports indicate that national grain production is likely to improve over the past two drought-affected seasons, but also that Iraq is likely to experience a 3rd consecutive below-normal winter grain harvest. During the March –April period Iraq's winter grains progress through the most important and moisture sensitive growth stages. This period is when the yield potential of the crop is set, and when prevailing weather conditions and/or irrigation supplies can have a substantially positive or negative influence on both rainfed and irrigated grain production prospects.

(2) Season-to-date cumulative precipitation throughout Iraq has been very favorable this year, with virtually all major grain growing regions recording near-normal to above-normal rainfall through late March (Figures 1-3). This is a considerable improvement over the past two years, when severe drought conditions predominated. The rainfall pattern was particularly favorable during November and December 2009, during the winter grain planting period. However, January 2010 was very dry, and newly established grain crops relied primarily on soil moisture reserves or supplemental irrigation to maintain growth. Excellent rains returned in February and March to most grain areas. The governorate of Ninawa bears special mention, in that it has received extremely beneficial rainfall this year. Ninawa is the largest single grain producing region of Iraq, typically accounting for 20 percent of the nations' wheat production and 32 percent of its barley output (Appendix – Figures A1-A2). Virtually all of the grain grown in Ninawa is non-irrigated, and highly variable rainfall conditions cause large fluctuations in annual grain production. Given the current moisture status in this governorate, winter grain production prospects are particularly strong in MY2010/11. Season-to-date precipitation over southeastern Turkey has also been much better than the previous two years, with higher than average rains affecting some of the

tributaries of both the Euphrates and Tigris Rivers (Figure 4). Rainfall during the first two decades of March 2010 has been below normal (Figure 5), and regional snowcover and depth at this time is also below normal, except in the most southeastern corner of Turkey (Figure 6). This implies that there may not be as much spring snowmelt for Turkish reservoir replenishment, and that water releases from Turkish dams along both the Tigris and Euphrates watersheds may not substantially improve this year. While winter rainfall in Iraq has been favorable, lake levels (stored water resources) have not significantly improved, as is seen with Buhayrat ath-Tharthar (Figure 7). The current lake level has increased since December 2009, but remains well-below normal. This lake may be recovering from the lowest level recorded in the past 8 years, as current levels have exceeded those of last year.

(3) The overall temperature regime in Iraq is heating up, with springtime daily maximum temperatures averaging 70-80 degrees Fahrenheit (21 – 27 degrees Celsius) in recent weeks. End of February temperatures were slightly warmer than normal for most of Iraq, with the beginning of March experiencing mostly normal temperatures and mid-March being unusually warm (Figure 8). These warmer temperatures will speed crop growth while also increasing crop water demand. In the south, these warm temperatures along with dust storms may have caused damage to crops in the reproductive and early grain-filling stages. The NOAA Climate Prediction Center 7-day rainfall forecast indicates that continued favorable showers are expected in most primary winter grain producing areas (Figure 9), while the 7-day temperature forecast indicates near-normal temperatures will prevail (Figure 10).

(4) A review of satellite-derived vegetative index data (NDVI) indicates that winter grain crops emerged throughout the country and showed strong growth and development during February and March. At the national level, the vegetation index data analysis indicates that most northern rainfed and southern irrigated crops are showing similar or better crop development than the previous two years, with the major exception of Diyala, Al-Qadisiyah, portions of Wasit, Dhi Qar, and Maysan (Figures 11, 12, 13, 14). Rainfed provinces appear to be at or near maximum NDVI (Figure 11), whereas irrigated regions have already achieved maximum NDVI (Figure 12). In particular, the marginal or opportunistically cropped central and western portions of Ninawa are displaying very strong development compared to last year, as are western Dahuk, Arbil, and portions of As-Sulaymaniyah (Figure 15). By comparison, the rainfed cropping regions of east-central As-Sulaymaniyah are displaying uncharacteristically poor vegetative development, though these northern producing regions have received very favorable winter rainfall. When comparing current crop development to the long-term mean (Figures 16-17) crop establishment in northern Iraq is near to well-above normal, including the core producing areas of Ninawa, Dahuk, Arbil, and As-Sulaymaniyah. In central and southern Iraq, crop establishment is better in comparison to last year but not the long-term mean due to the lack of irrigation water (Figure 18, 19, 20, 21). In general, the differences in early season crop development illustrated in these maps provide a cautionary warning that despite beneficial rainfall so far this year, not all areas are performing well.

(5) MODIS satellite images of Iraq show that the major winter grain growing regions are greener than last month in the north and are less well developed in the central and south compared to last year (Figure 22, 23, 24). This helps confirm that increased rainfall has led to generally favorable crop development, especially across the northern half of the country. Comparison

of MODIS NDVI anomaly data with Quickbird satellite imagery shows that NDVI is below the long-term mean in some marginal areas of Ninawa, even though there are established crops (Figure 25). Although these crops are thin, they will likely result in a beneficial harvest in a region which was unable to be planted the past two years owing to severe drought. Some irrigated areas are very green with well-established crops, such as parts of Karbala' and Babil by the Euphrates River (Figure 26). However, Quickbird and SPOT data show that many irrigated areas are indeed faring poorly in comparison with the long-term mean, as seen for Wasit in Figure 27 and Diyala in Figure 28. This satellite imagery confirms that major irrigated areas which are normally sown to winter grains are in fact fallow this year.

(6) The appendix contains national production maps for wheat (Figure A1) and barley (Figure A2), the crop calendar for Iraq (Figure A3), and a map of above ground Iraqi water resources (Figure A4).

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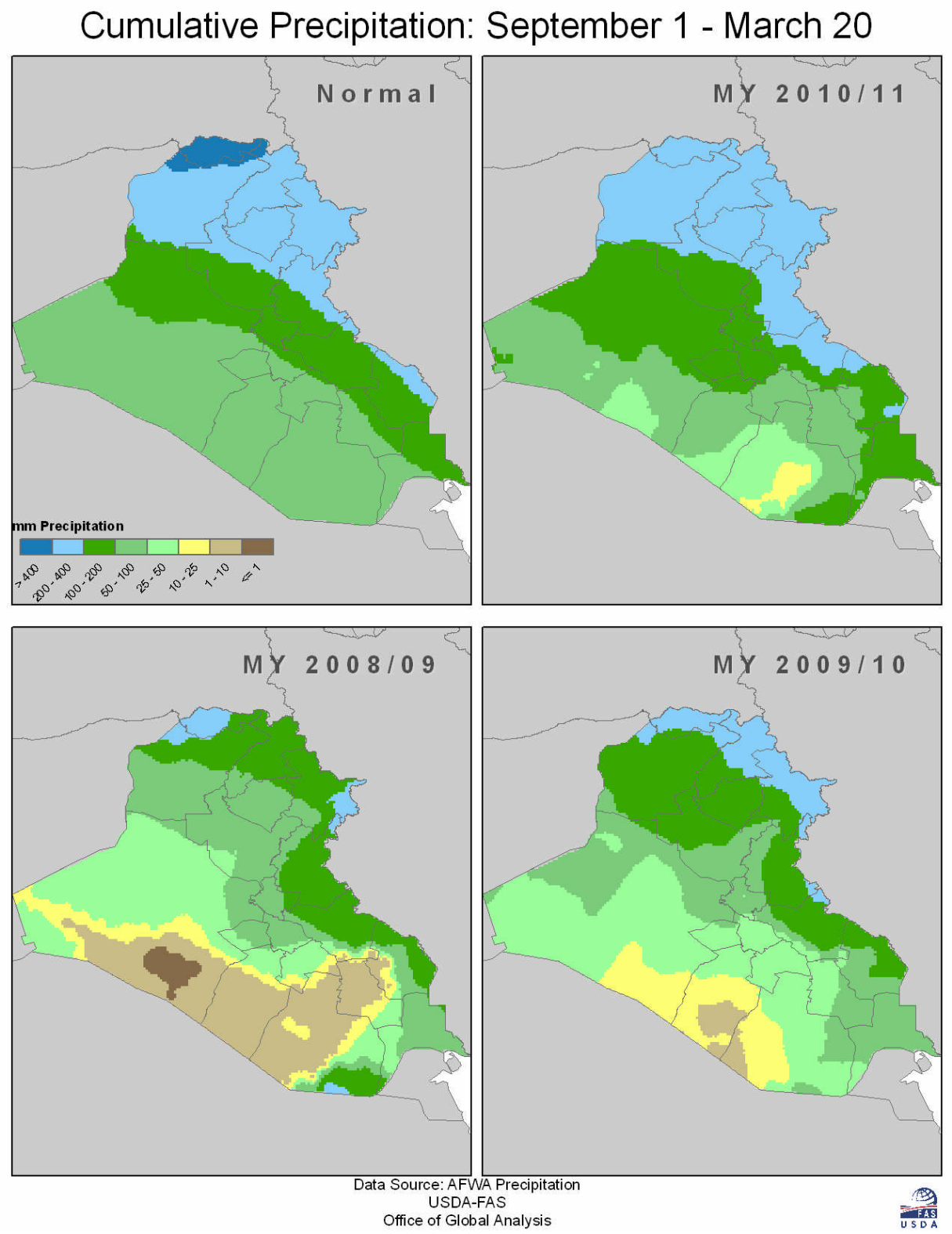

Figure 1. Season to date cumulative precipitation, September 1 to February 20. Current year compared against previous two crop seasons.

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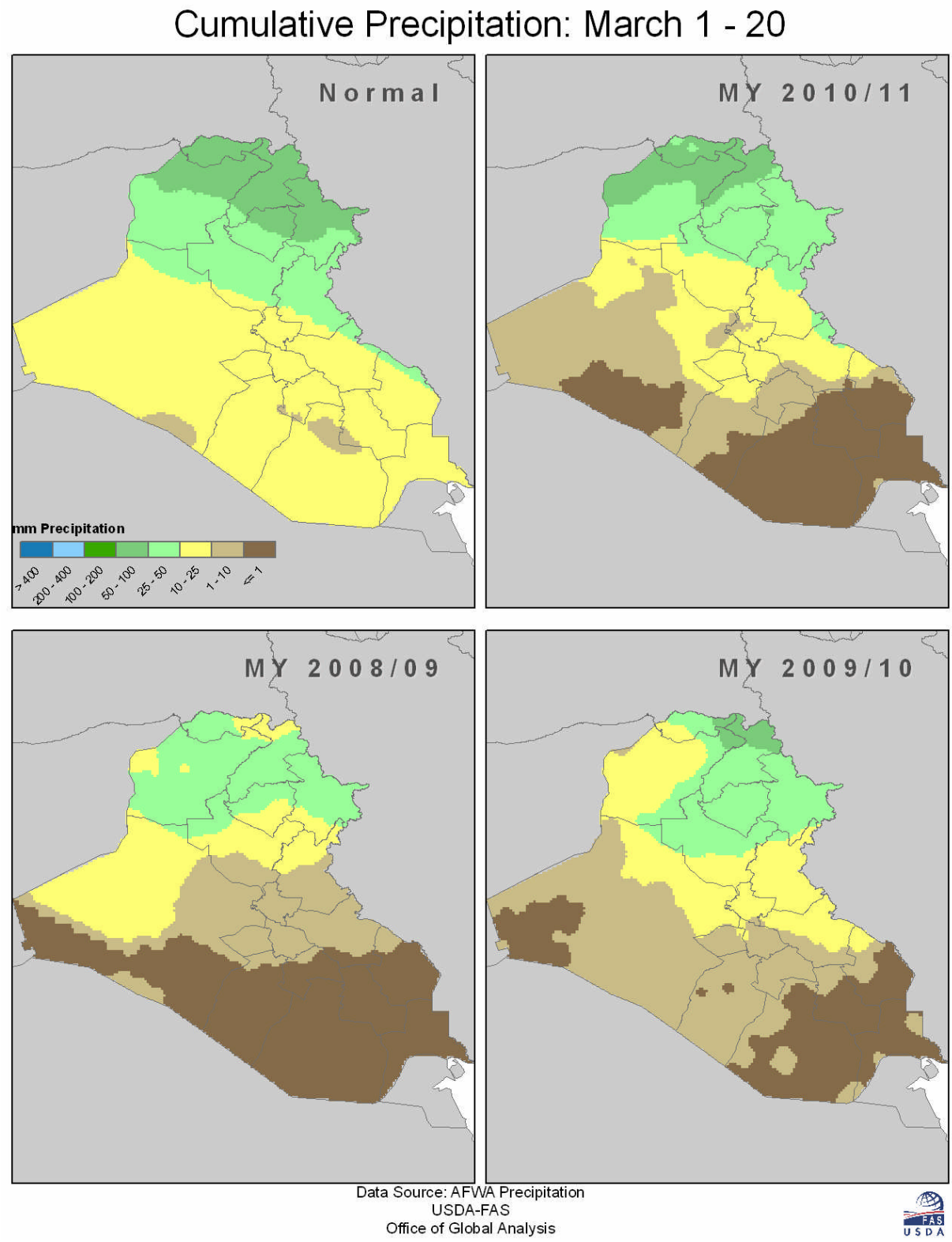

Figure 2. Cumulative precipitation, February 1 - 20. Current year compared against previous two crop seasons.

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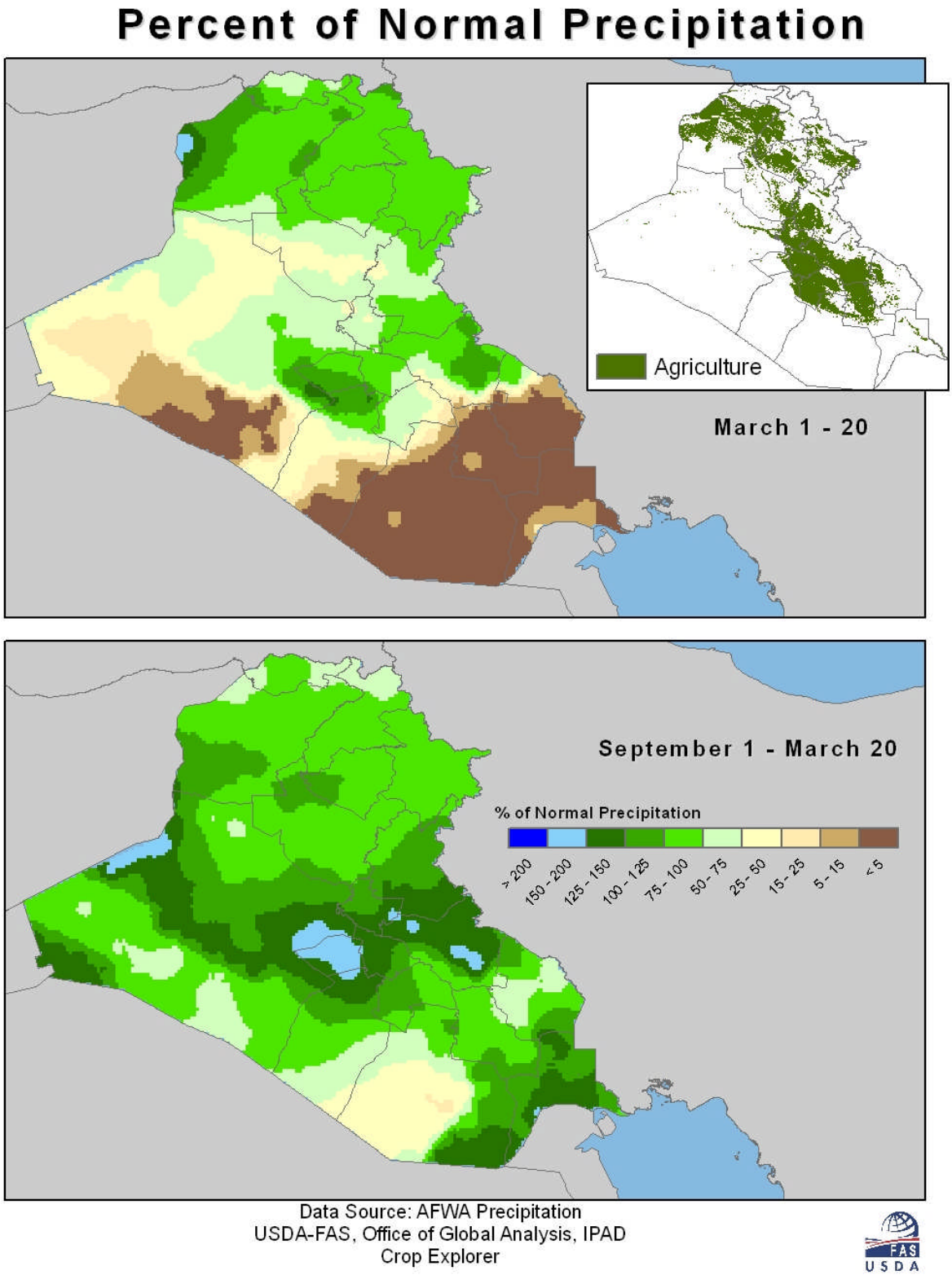

Figure 3. Monthly and season-to-date percent of normal precipitation for MY 2010/11.

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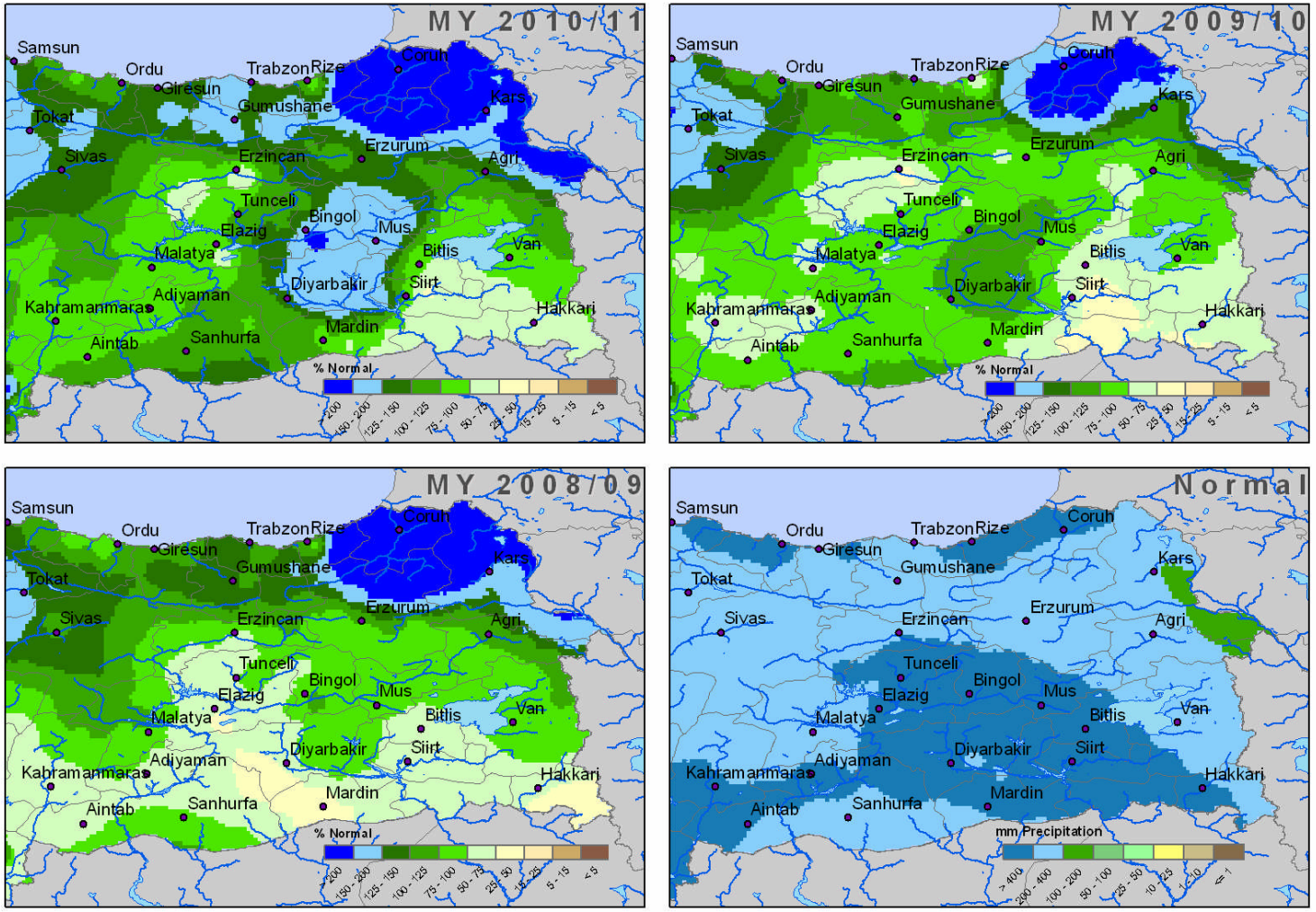
E. Turkey: Percent of Normal Cumulative Precipitation: September 1 - March 20



Data Source: AFWA Precipitation
USDA/FAS/OGA/IPAD

Figure 4. Season-to-date percent normal precipitation and normals for eastern Turkey.

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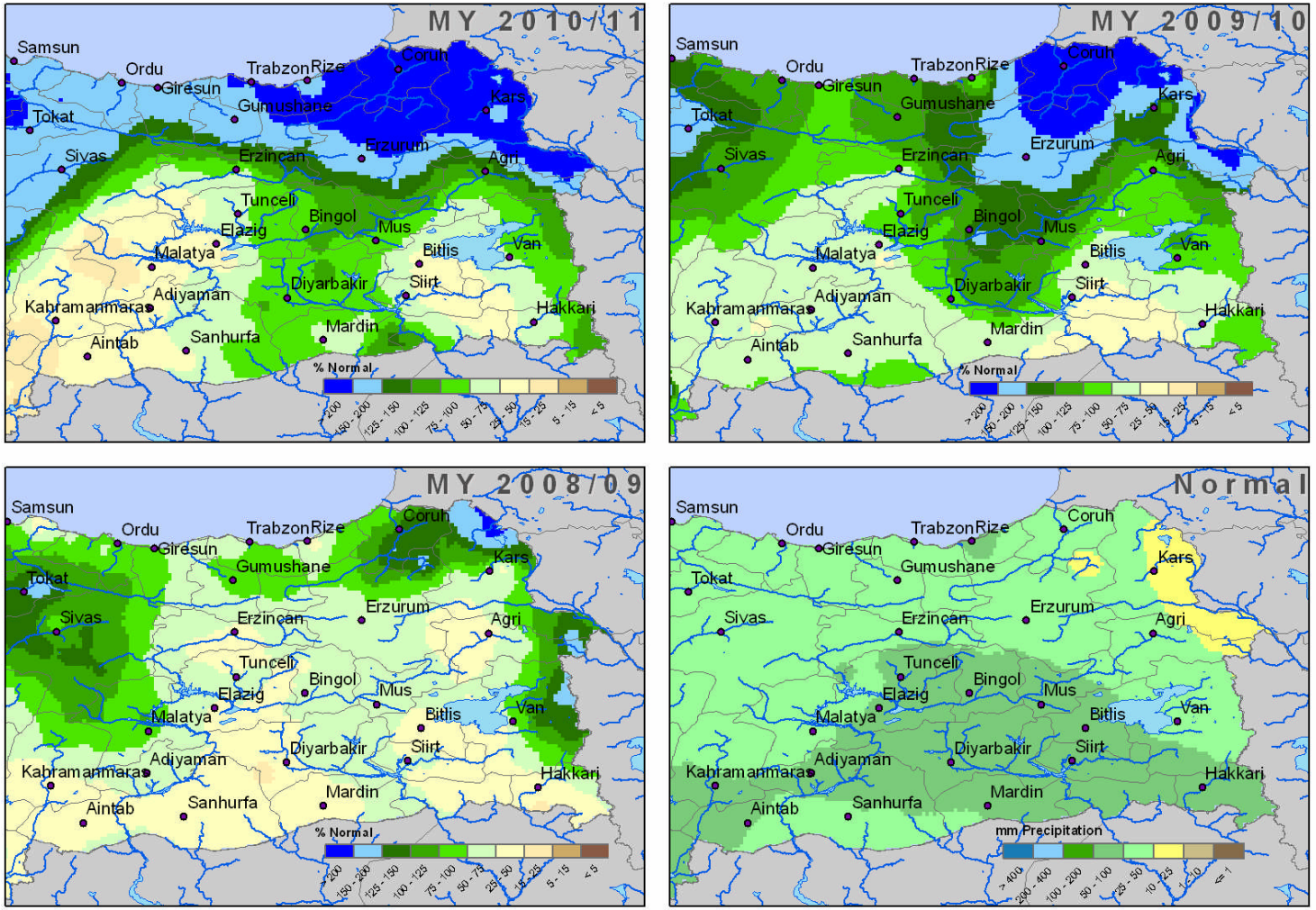
E. Turkey: Percent of Normal Cumulative Precipitation: March 1 - 20



Data Source: AFWA Precipitation
USDA/FAS/OGA/IPAD

Figure 5. Percent normal precipitation and normals for eastern Turkey for the first two decades of February.

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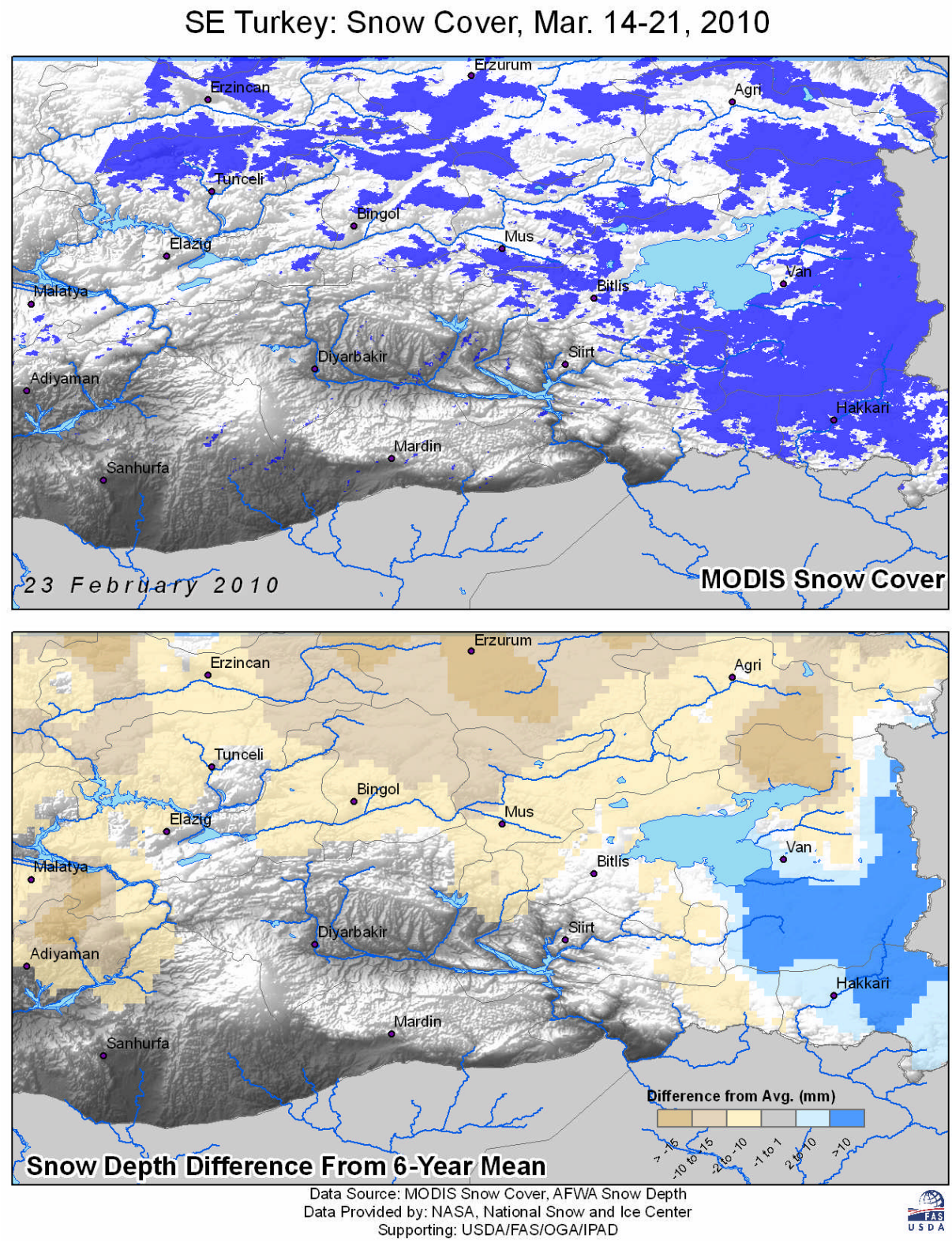
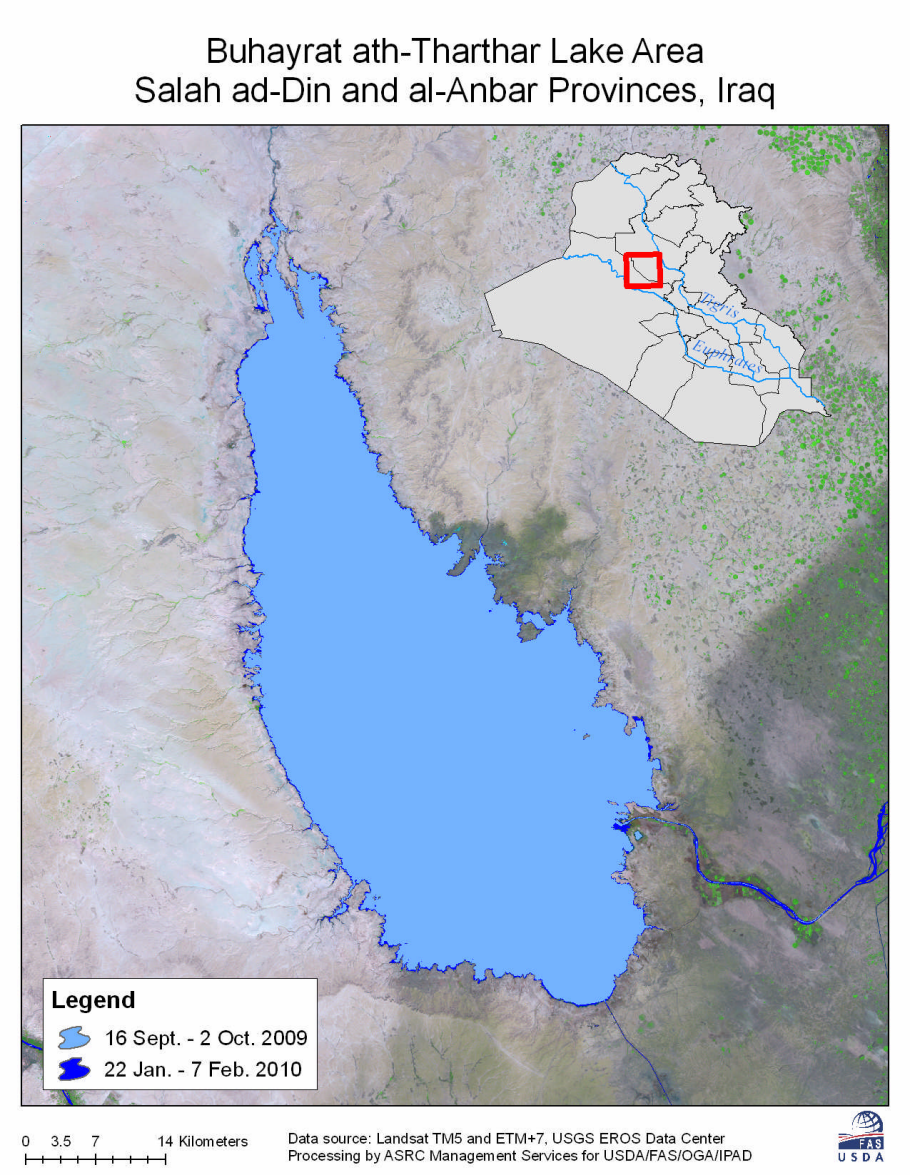


Figure 6. MODIS Snow cover and AFWA snow depth difference from 6-year average for eastern Turkey.



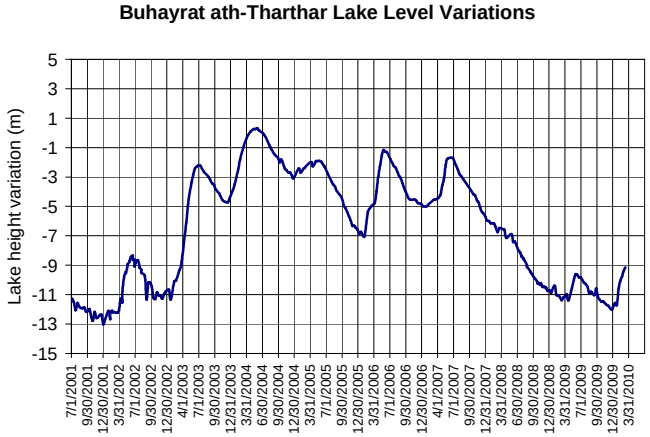


Figure 7. Lake level changes for Buhayrat ath-Tharthar.

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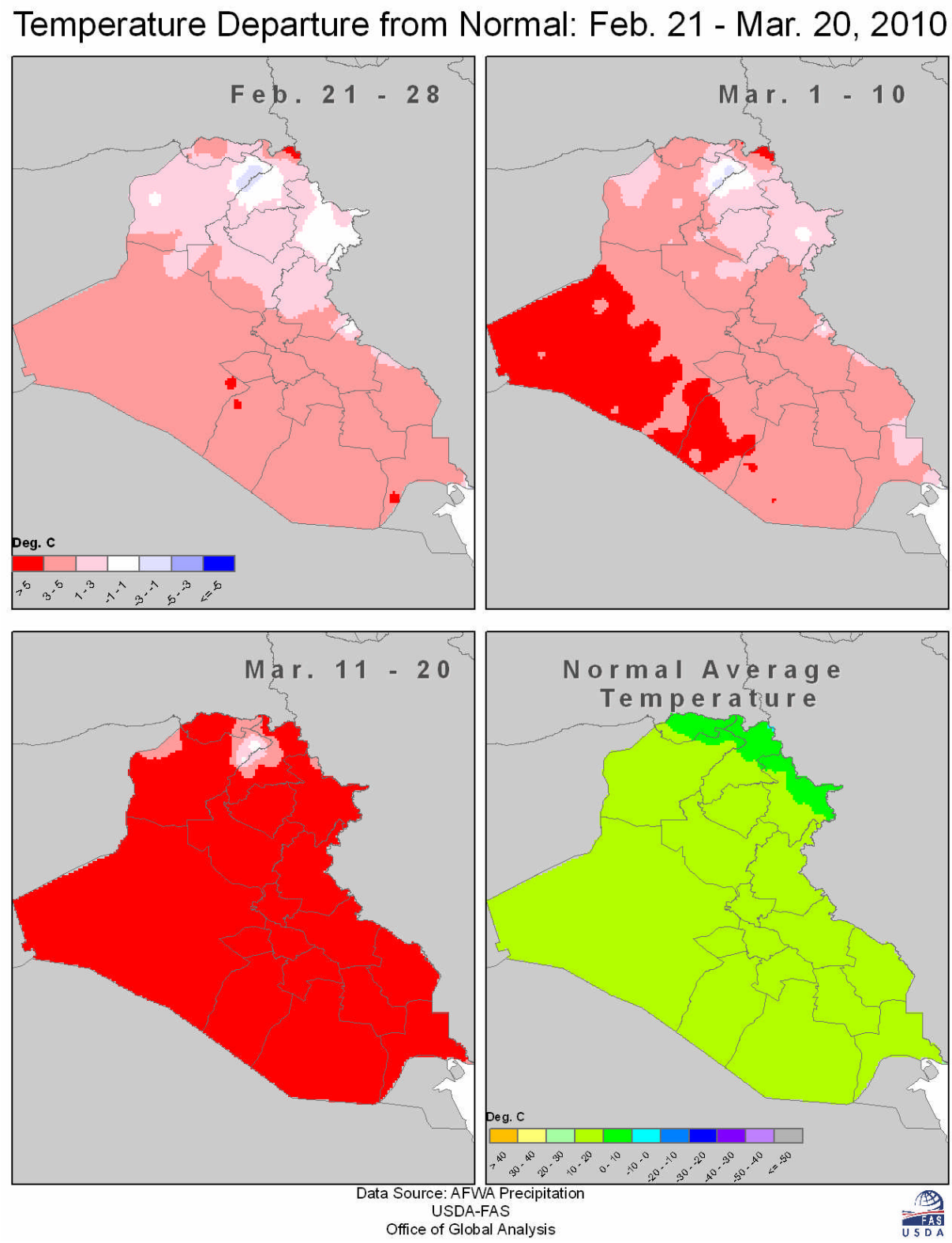

Figure 8. Temperature departure from normal in degrees Centigrade for the last decade of January and the first two decades of February 2010, and average temperature for that period.

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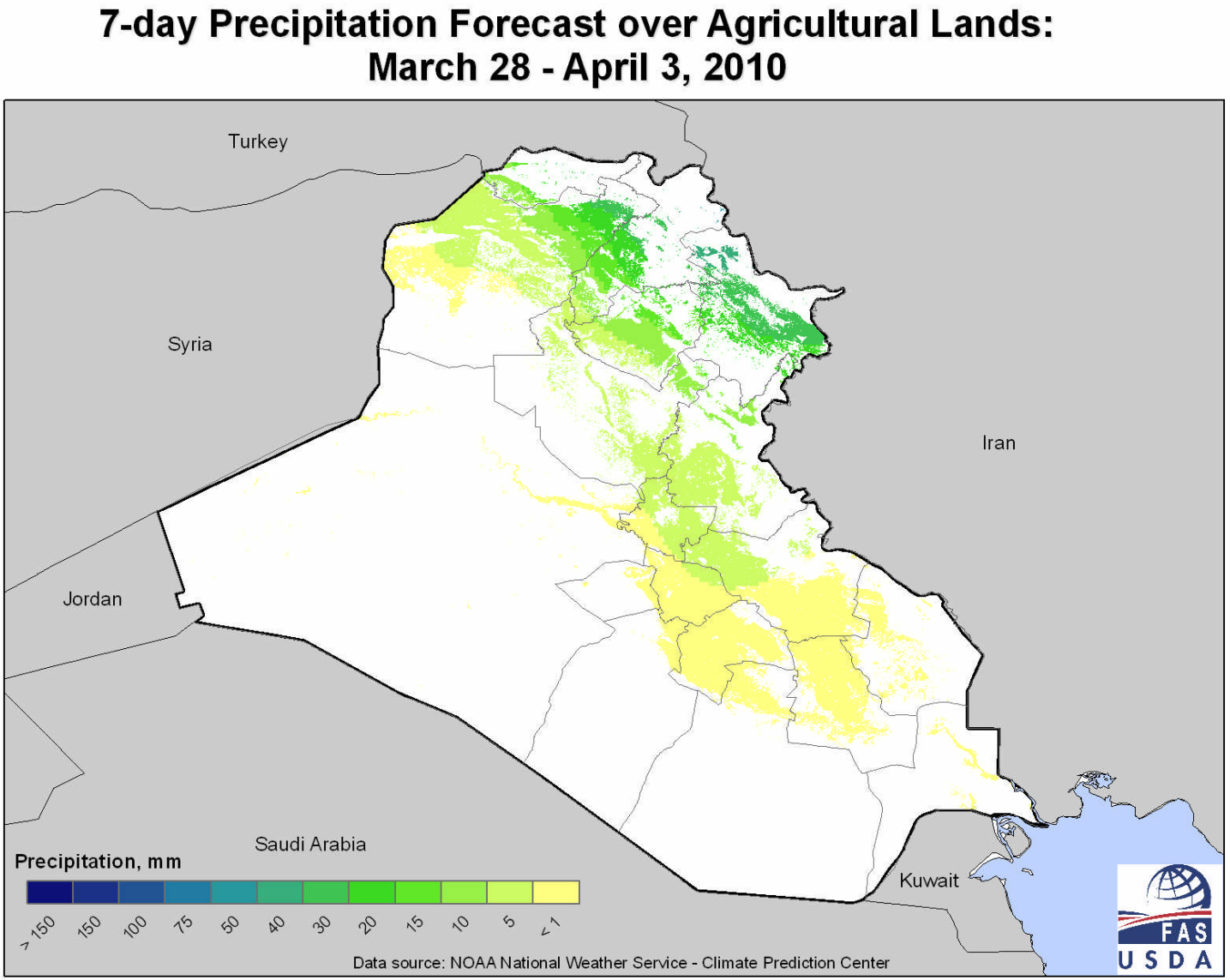

Figure 9. Seven-day precipitation forecast.

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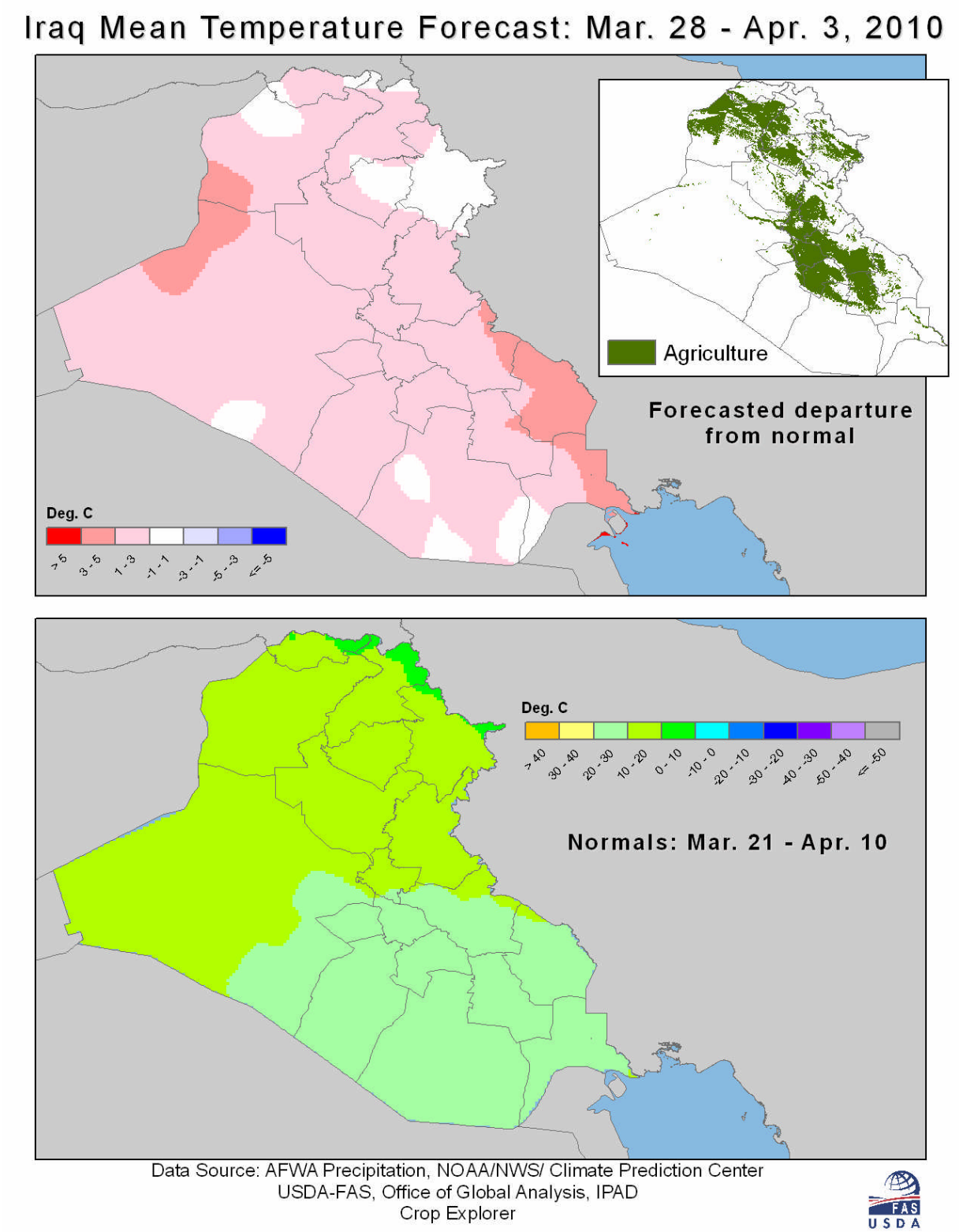

Figure 10. Seven day mean temperature forecast and normal temperatures.

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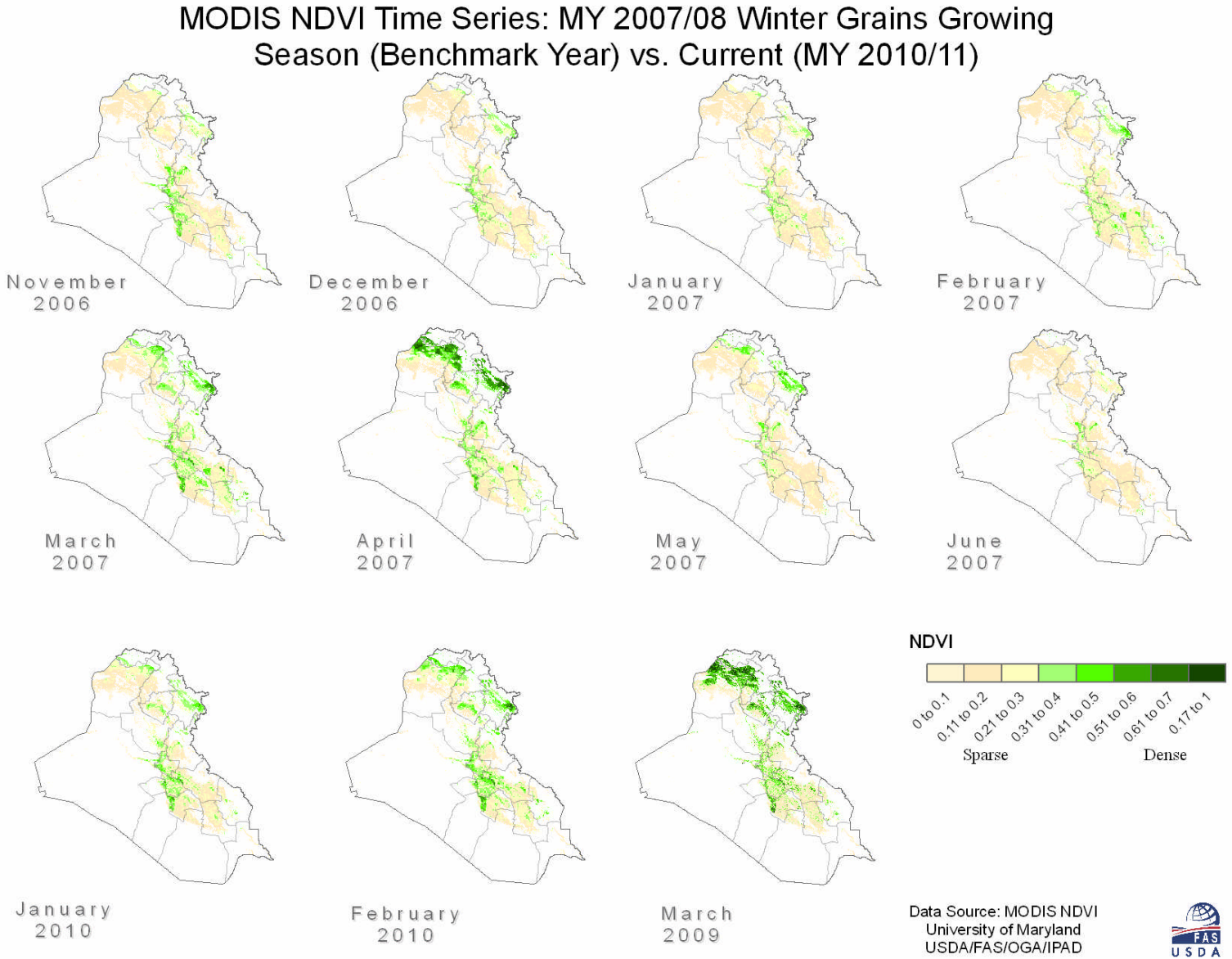

Figure 11. Vegetation growth through the winter grains growing season.

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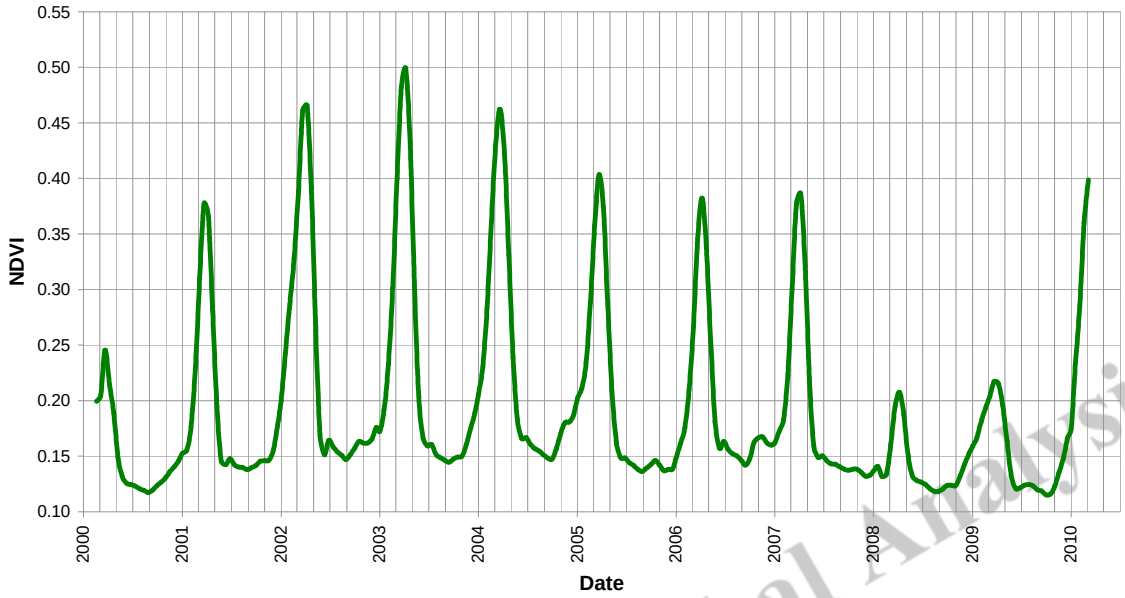
Arbil, Iraq Rainfed Agriculture NDVI Time Series



As-Sulaymaniyah, Iraq Rainfed Agriculture NDVI Time Series

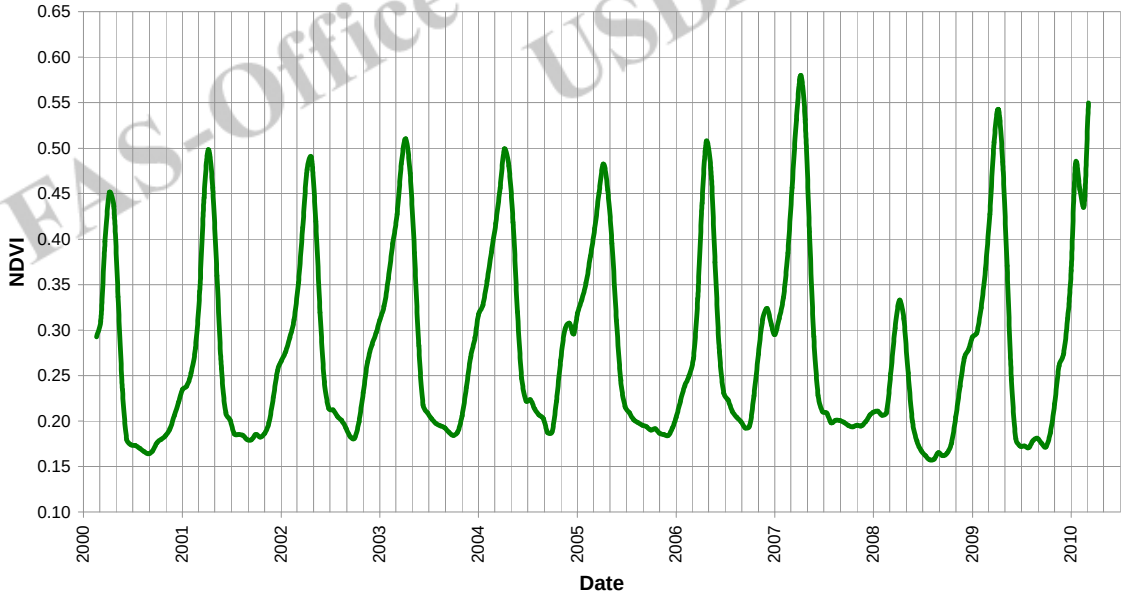


Figure 12a. MODIS NDVI time-series: important northern rainfed agricultural provinces.

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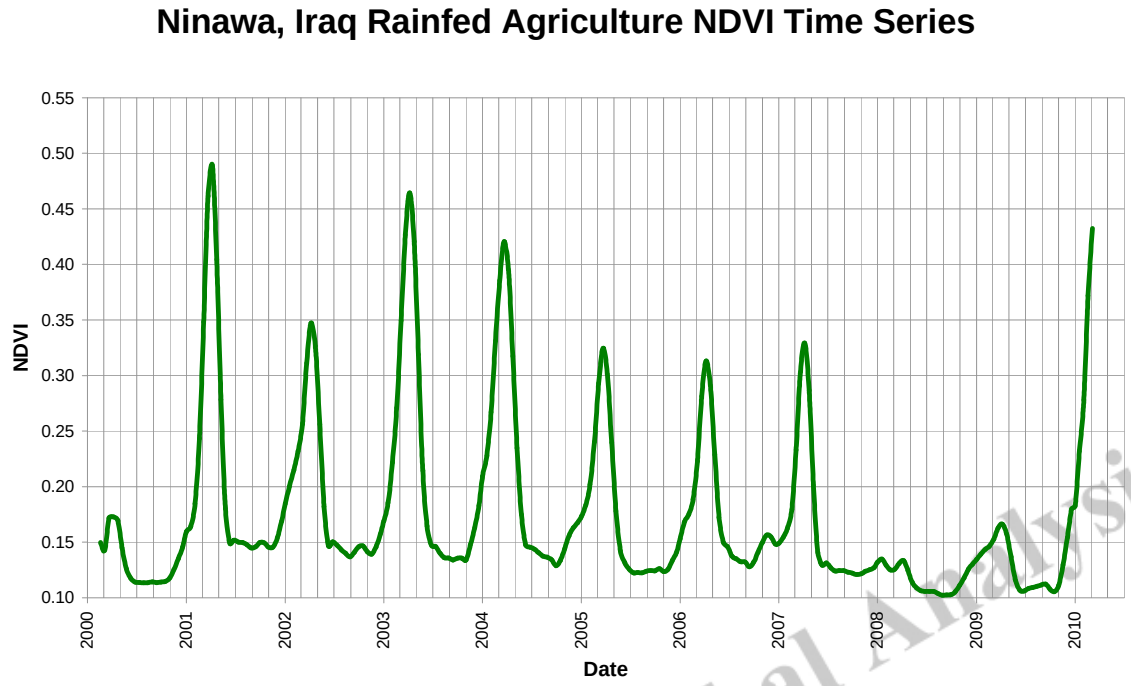

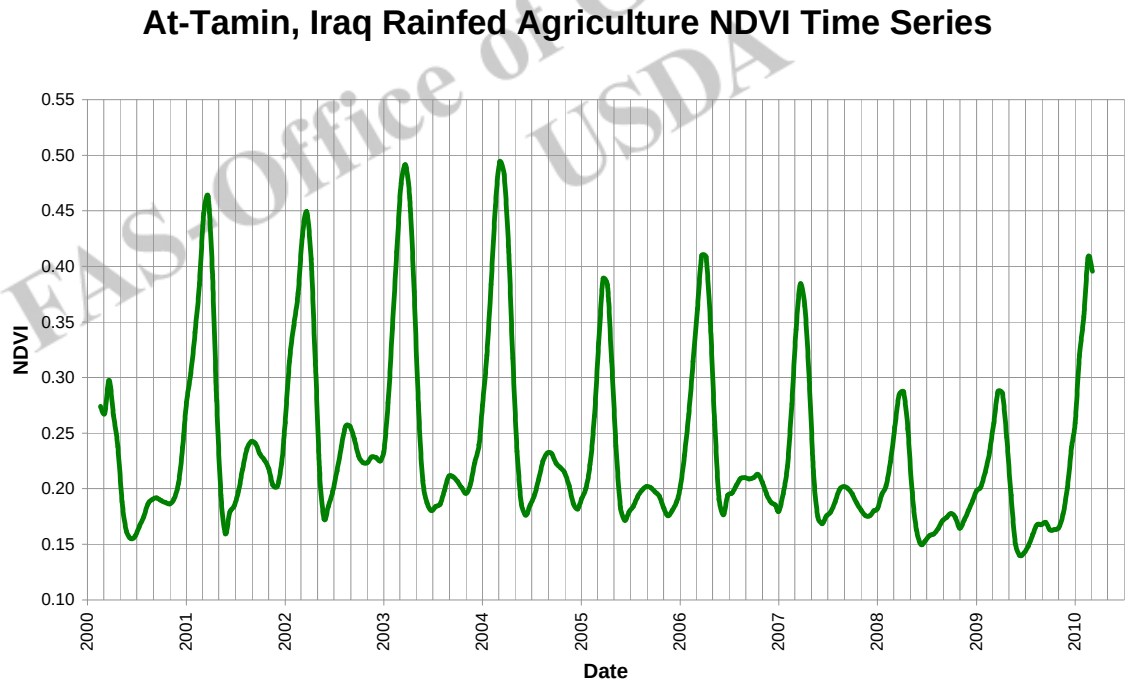

Figure 12b. MODIS NDVI time-series: important northern rainfed agricultural provinces.

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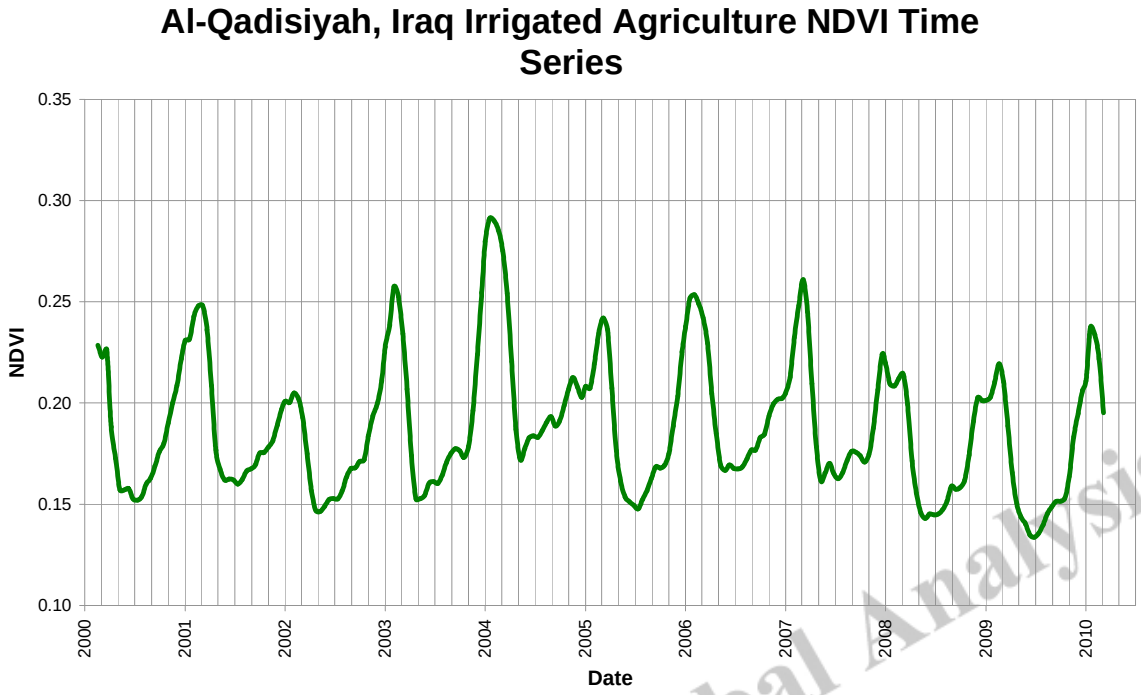

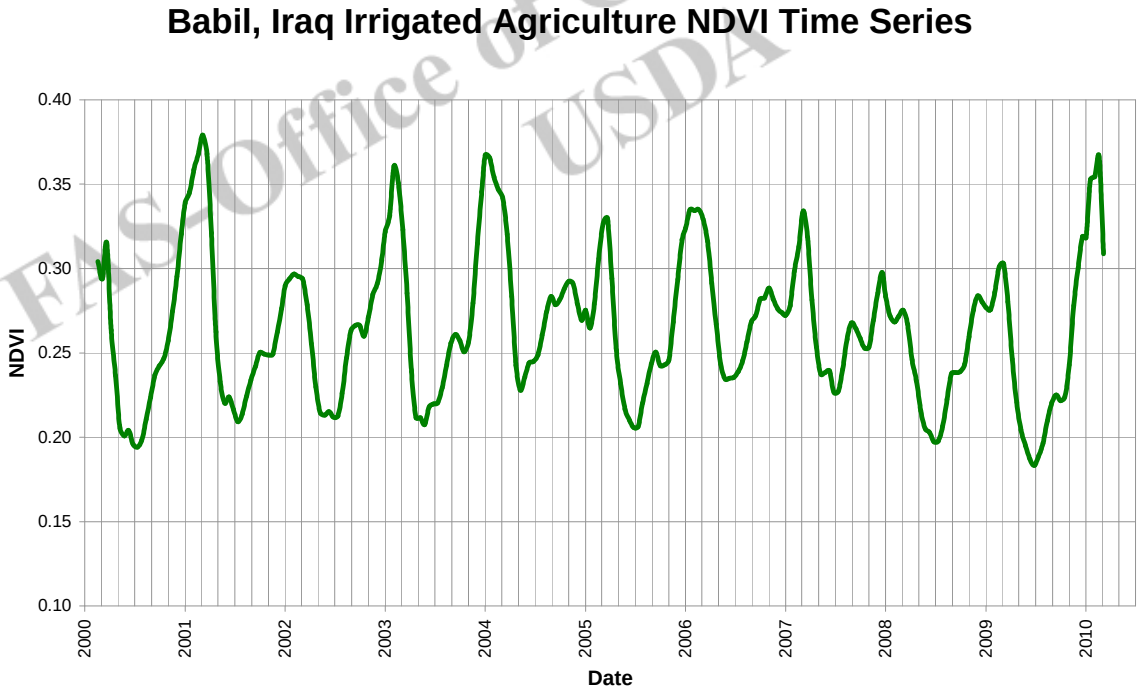

Figure 13a: MODIS NDVI time-series: important southern irrigated agricultural provinces.

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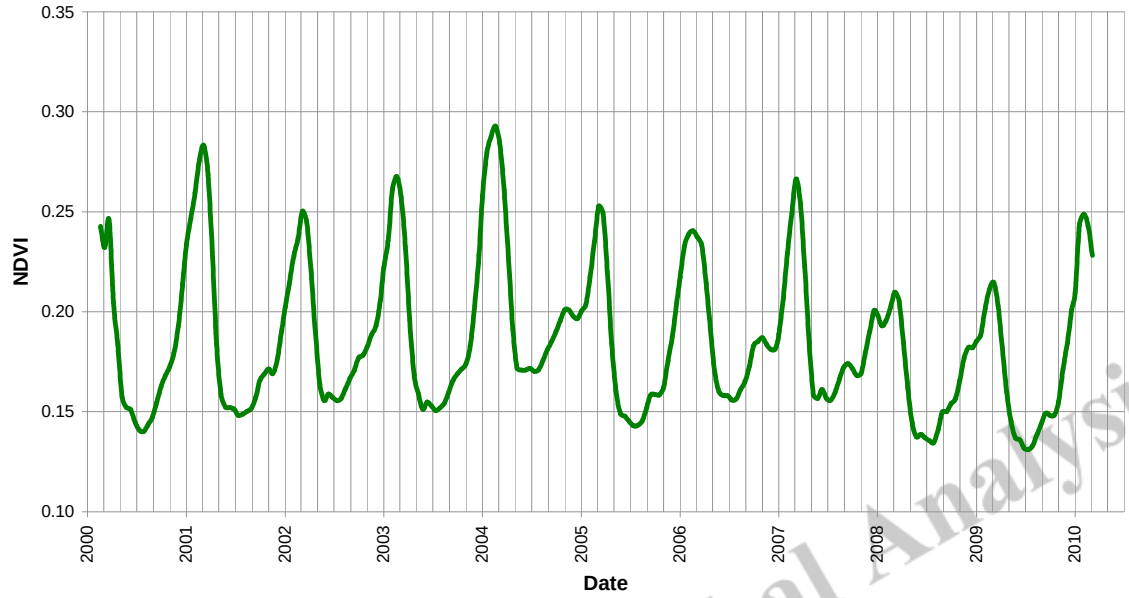
Wasit, Iraq Irrigated Agriculture NDVI Time Series



Diyala, Iraq Irrigated Agriculture NDVI Time Series

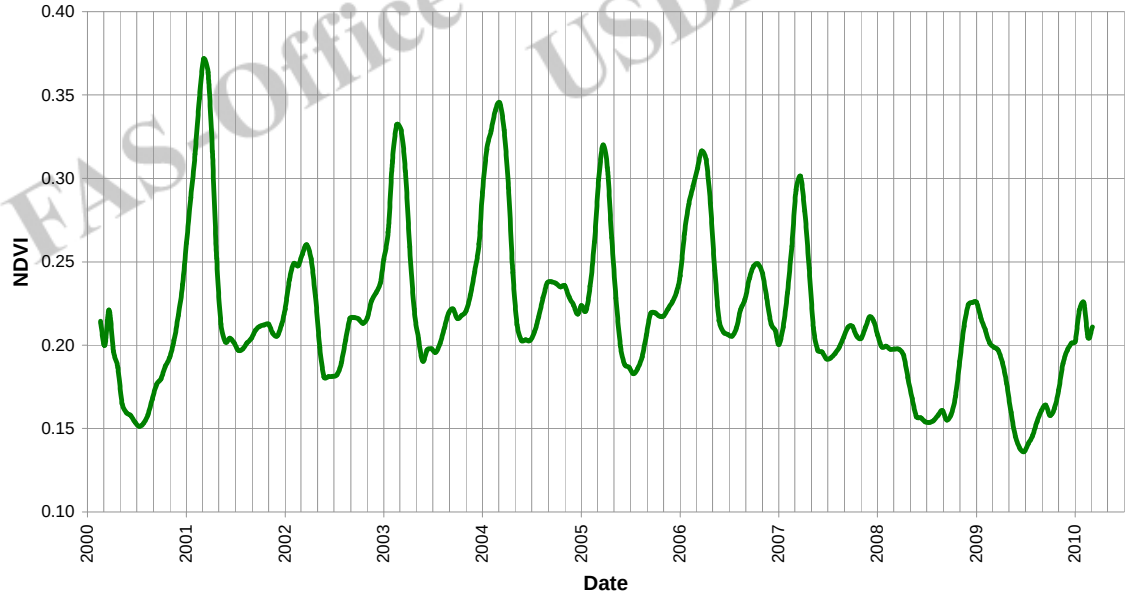


Figure 13b: MODIS NDVI time-series: important southern irrigated agricultural provinces.

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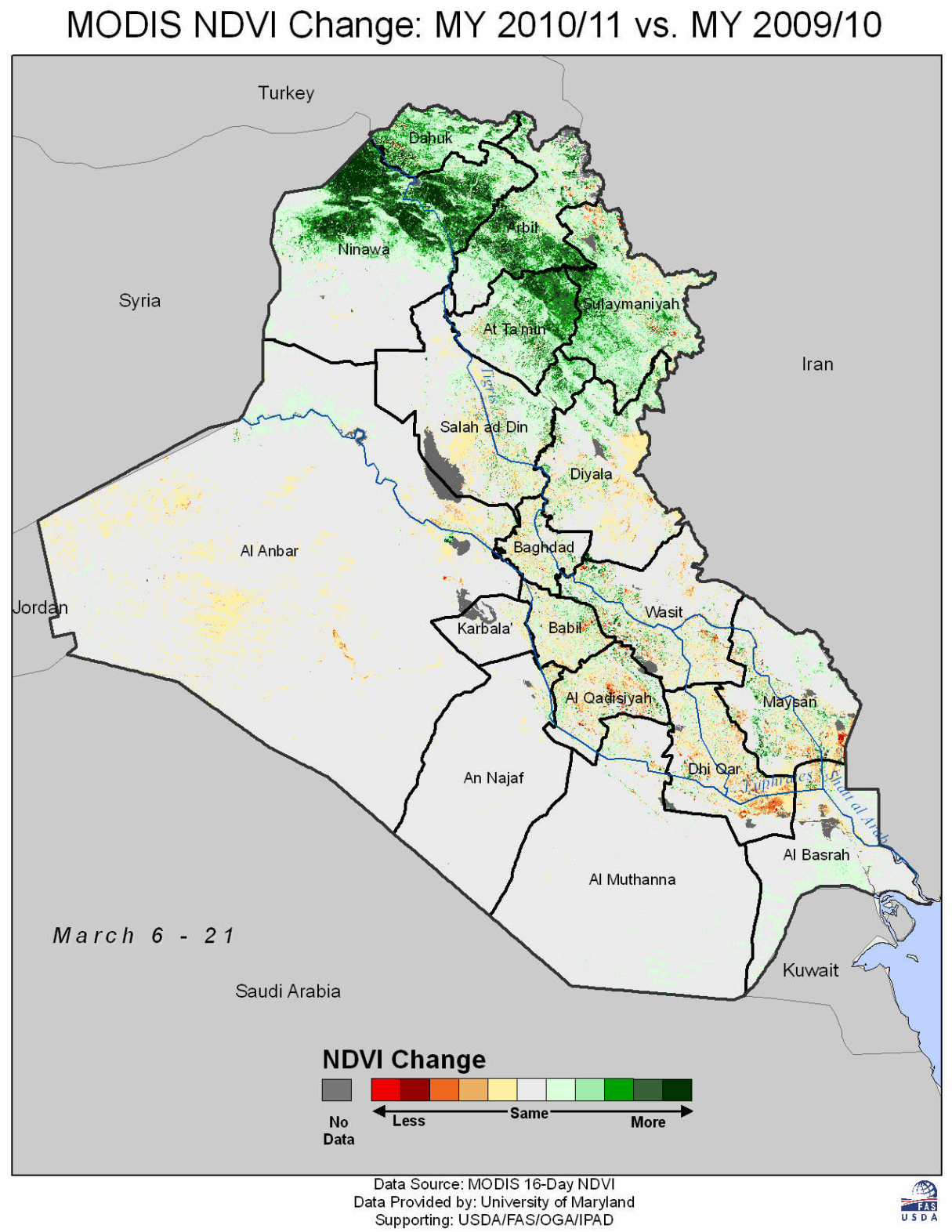

Figure 14. Change in MODIS NDVI: MY 2010/11 vs. MY 2009/10 drought year.

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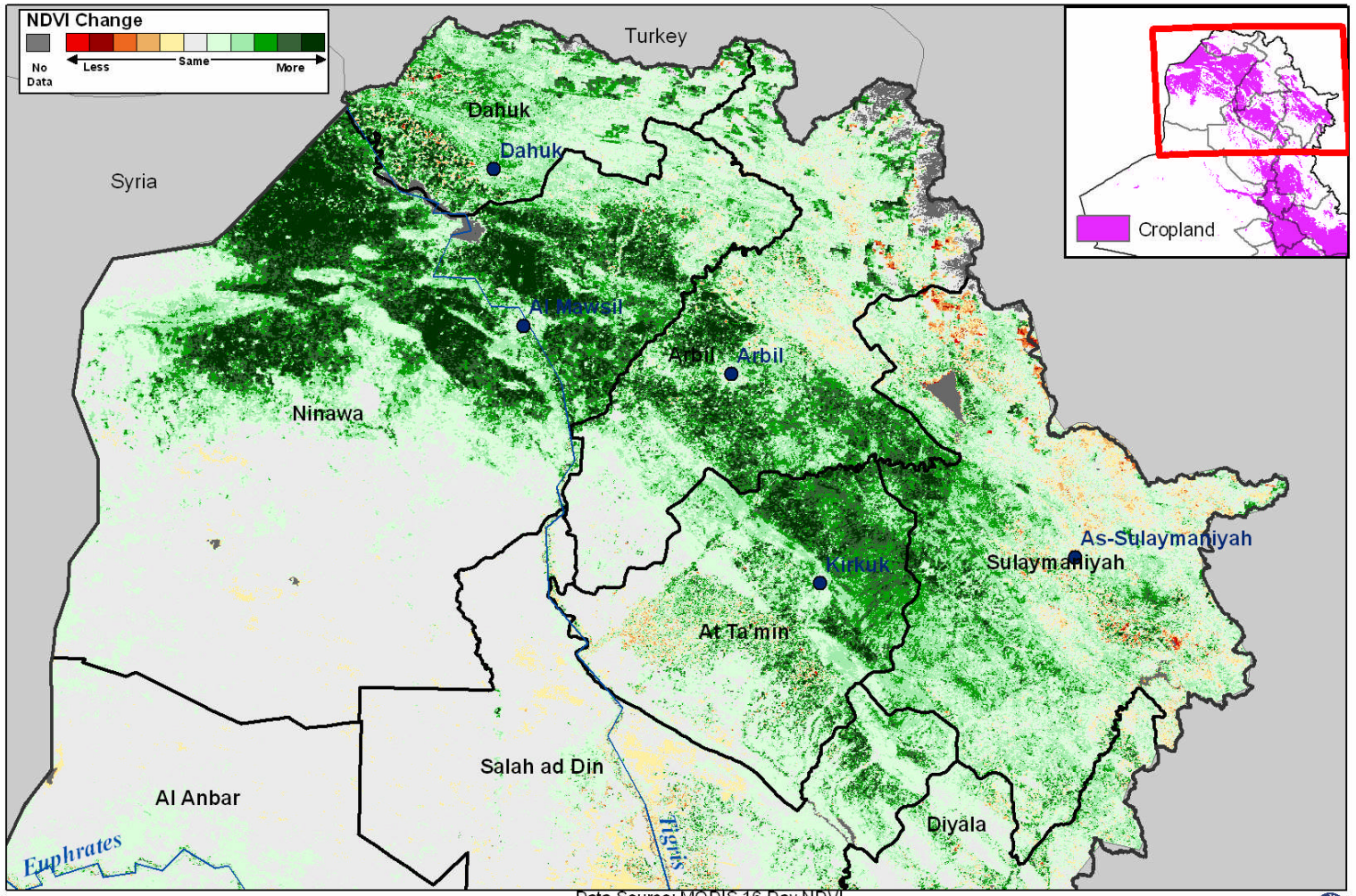
MODIS NDVI Change in Northern Iraq: MY 2010/11 vs. MY 2009/10



March 6 - 21

Data Source: MODIS 16-Day NDVI
Data Provided by: University of Maryland
Supporting: USDA/FAS/OGA/IPAD

Figure 15. Change in MODIS NDVI for northern Iraq: MY 2010/11 vs. MY 2009/10 drought year. Red box in inset map denotes main scene extent.

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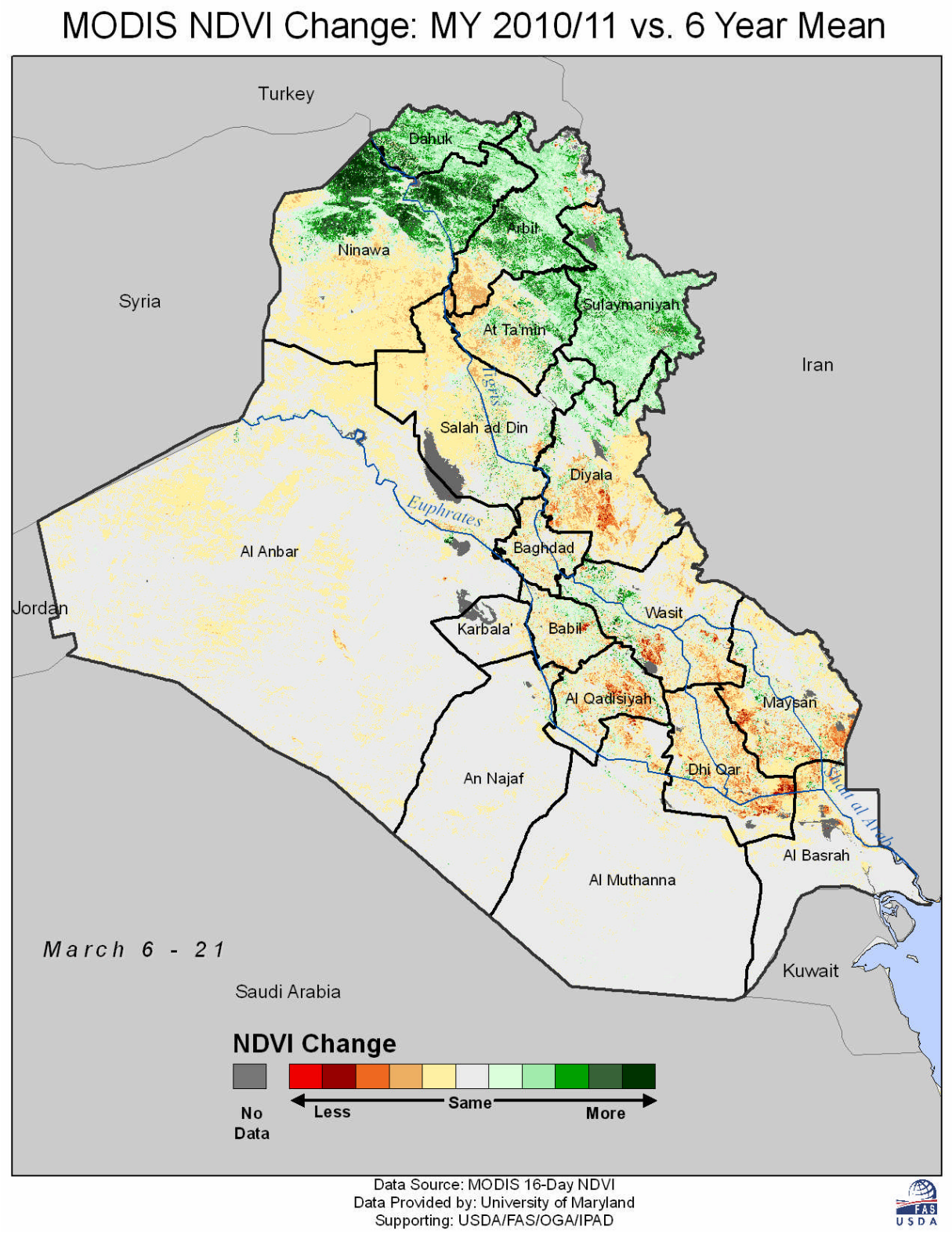

Figure 16. Change in MODIS NDVI: MY 2010/11 vs. 6-year average.

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MODIS NDVI Change in Northern Iraq: MY 2010/11 vs. 6 Year Mean

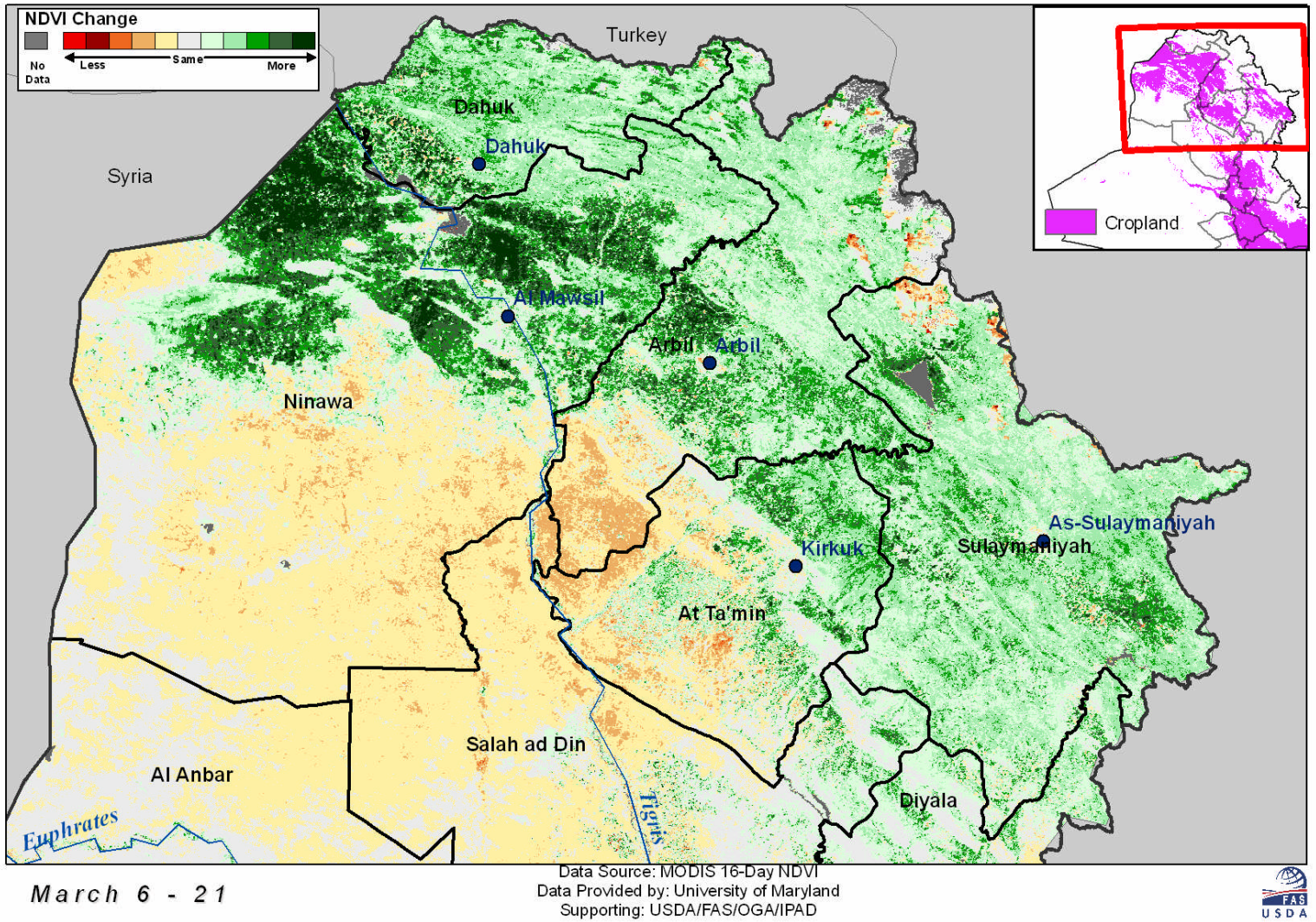

Figure 17. Change in MODIS NDVI for northern Iraq: MY 2010/11 vs. vs. 6-year average. Red box in inset map denotes main scene extent.

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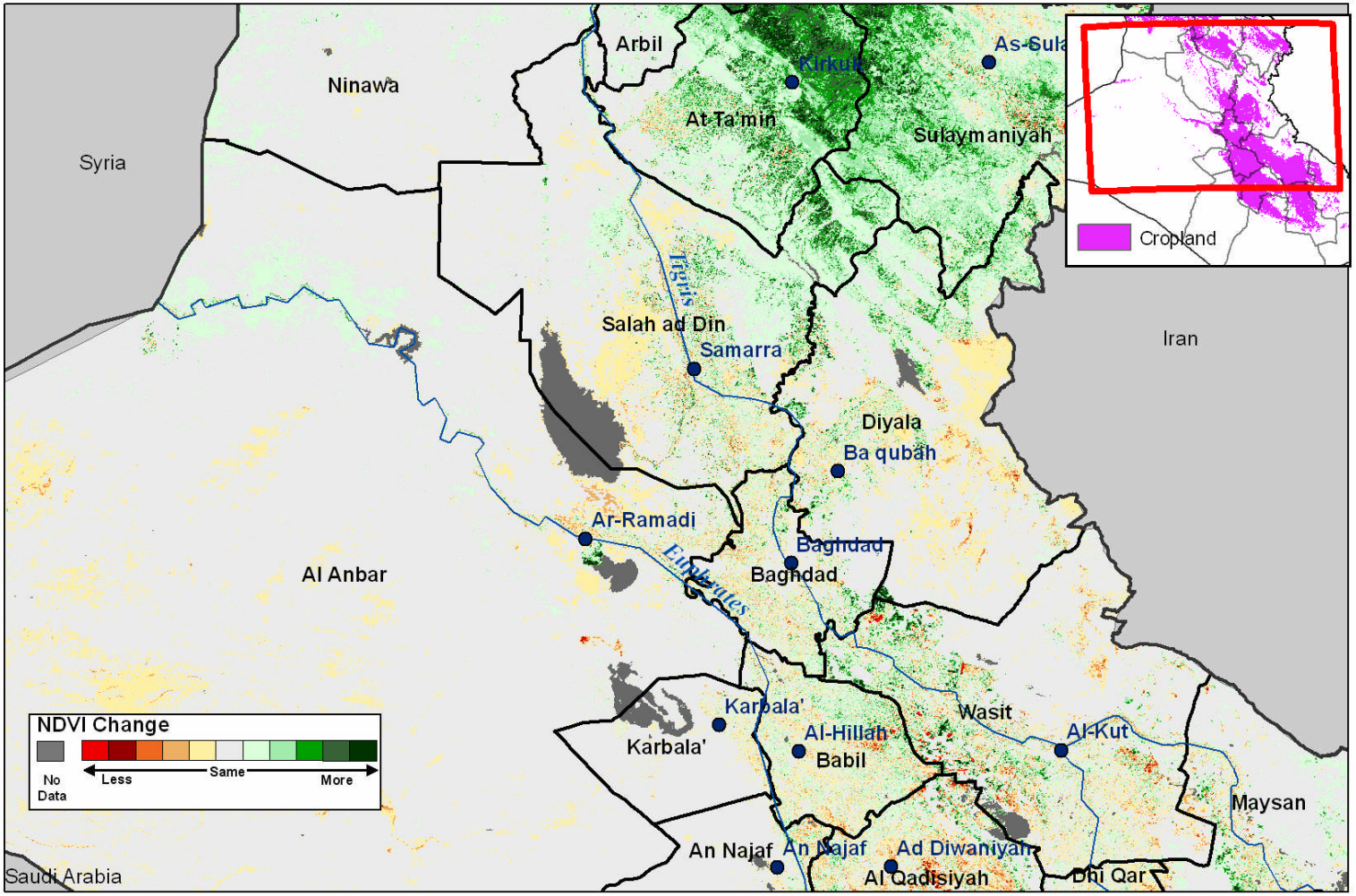
MODIS NDVI Change in Central Iraq: MY 2010/11 vs. MY 2009/10



March 6 - 21

Data Source: MODIS 16-Day NDVI
Data Provided by: University of Maryland
Supporting: USDA/FAS/OGA/IPAD

Figure 18. Change in MODIS NDVI for central Iraq: MY 2010/11 vs. MY 2009/10 drought year. Red box in inset map denotes main scene extent.

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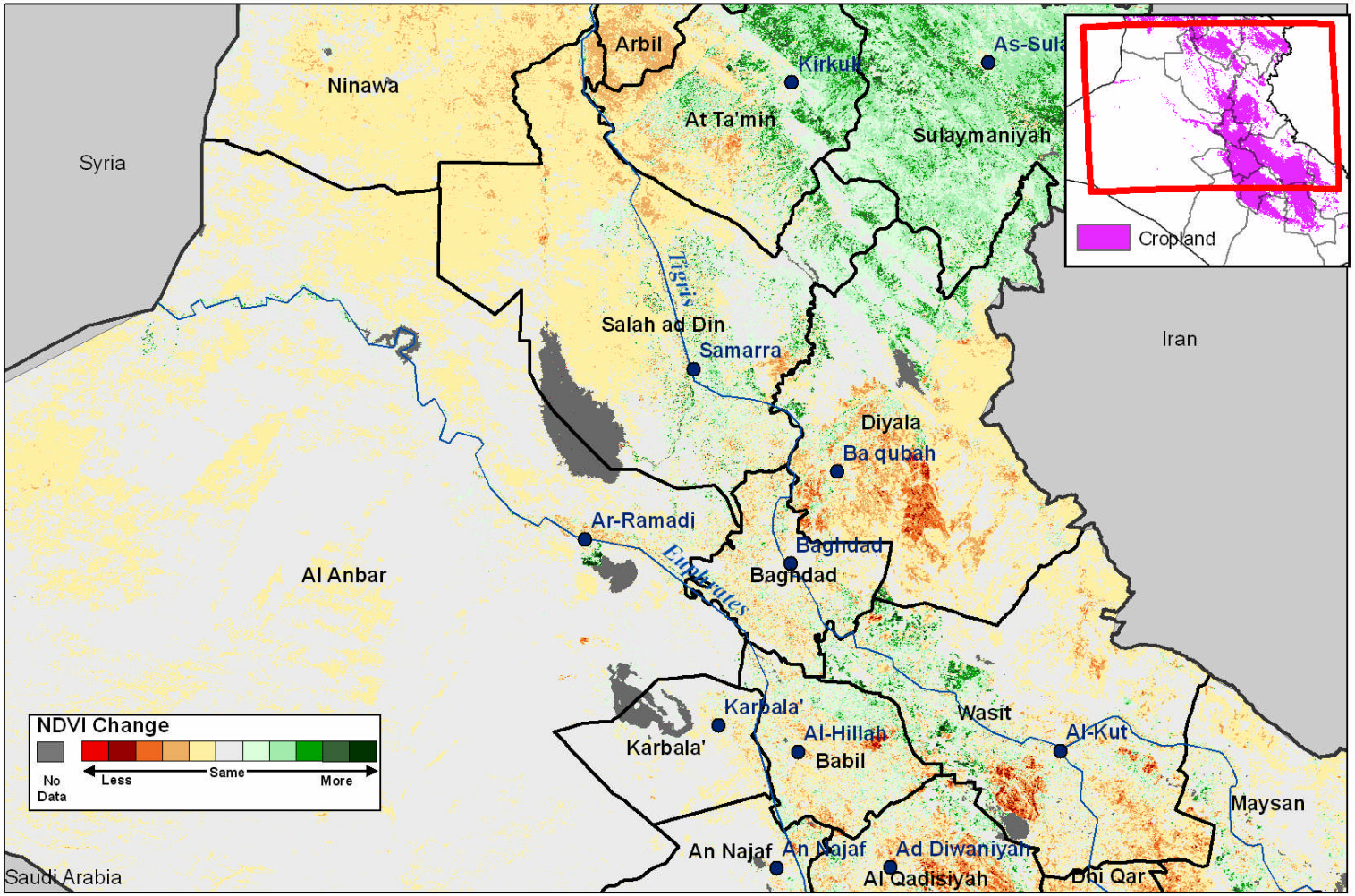
MODIS NDVI Change in Central Iraq: MY 2010/11 vs. 6 Year Mean



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Data Source: MODIS 16-Day NDVI
Data Provided by: University of Maryland
Supporting: USDA/FAS/OGA/IPAD

Figure 19. Change in MODIS NDVI for central Iraq: MY 2010/11 vs. vs. 6-year average. Red box in inset map denotes main scene extent.

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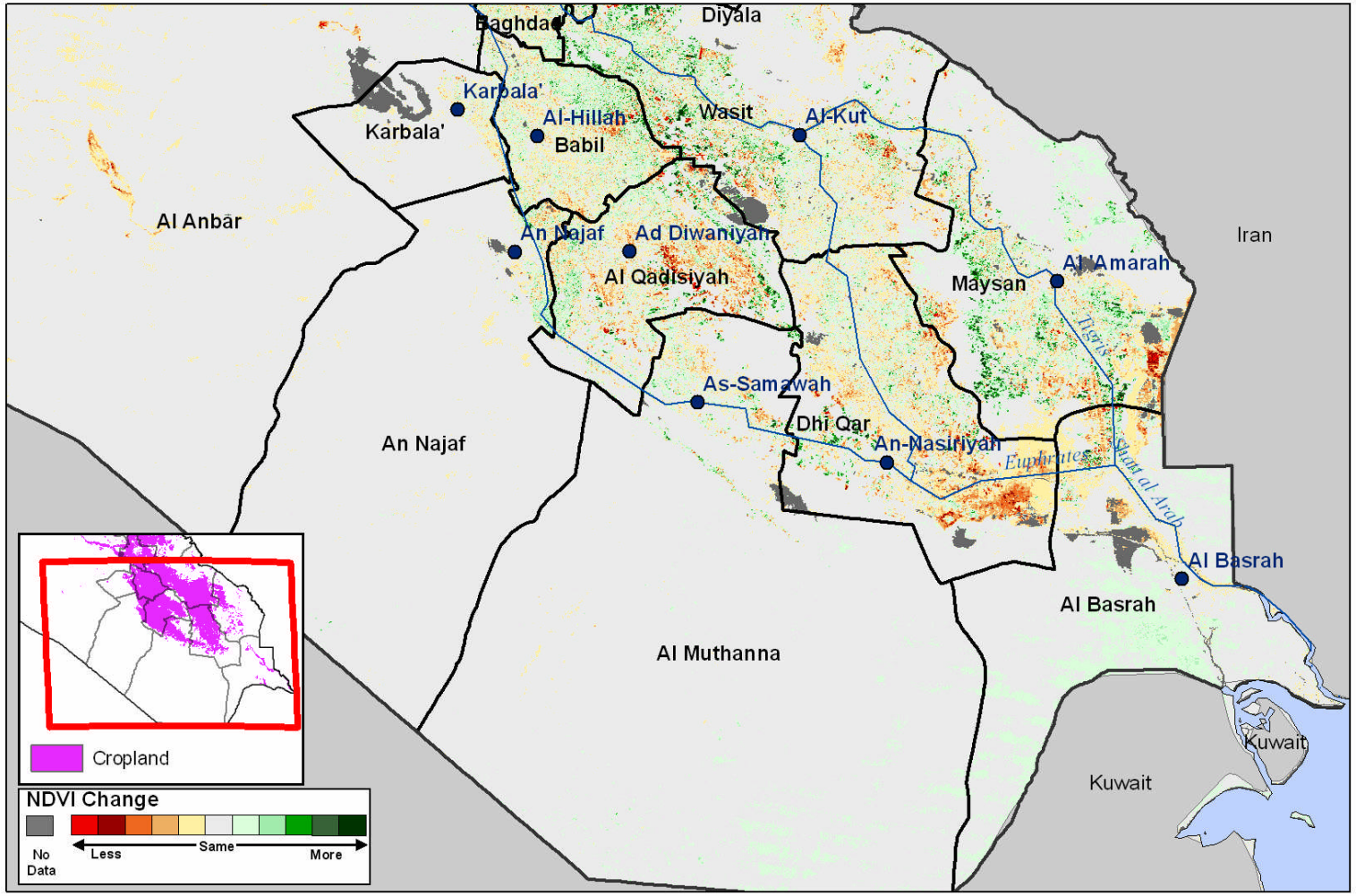
MODIS NDVI Change in Southern Iraq: MY 2010/11 vs. MY 2009/10



March 6 - 21

Data Source: MODIS 16-Day NDVI
Data Provided by: University of Maryland
Supporting: USDA/FAS/OGA/IPAD

Figure 20. Change in MODIS NDVI for southern Iraq: MY 2010/11 vs. MY 2009/10 drought year. Red box in inset map denotes main scene extent.

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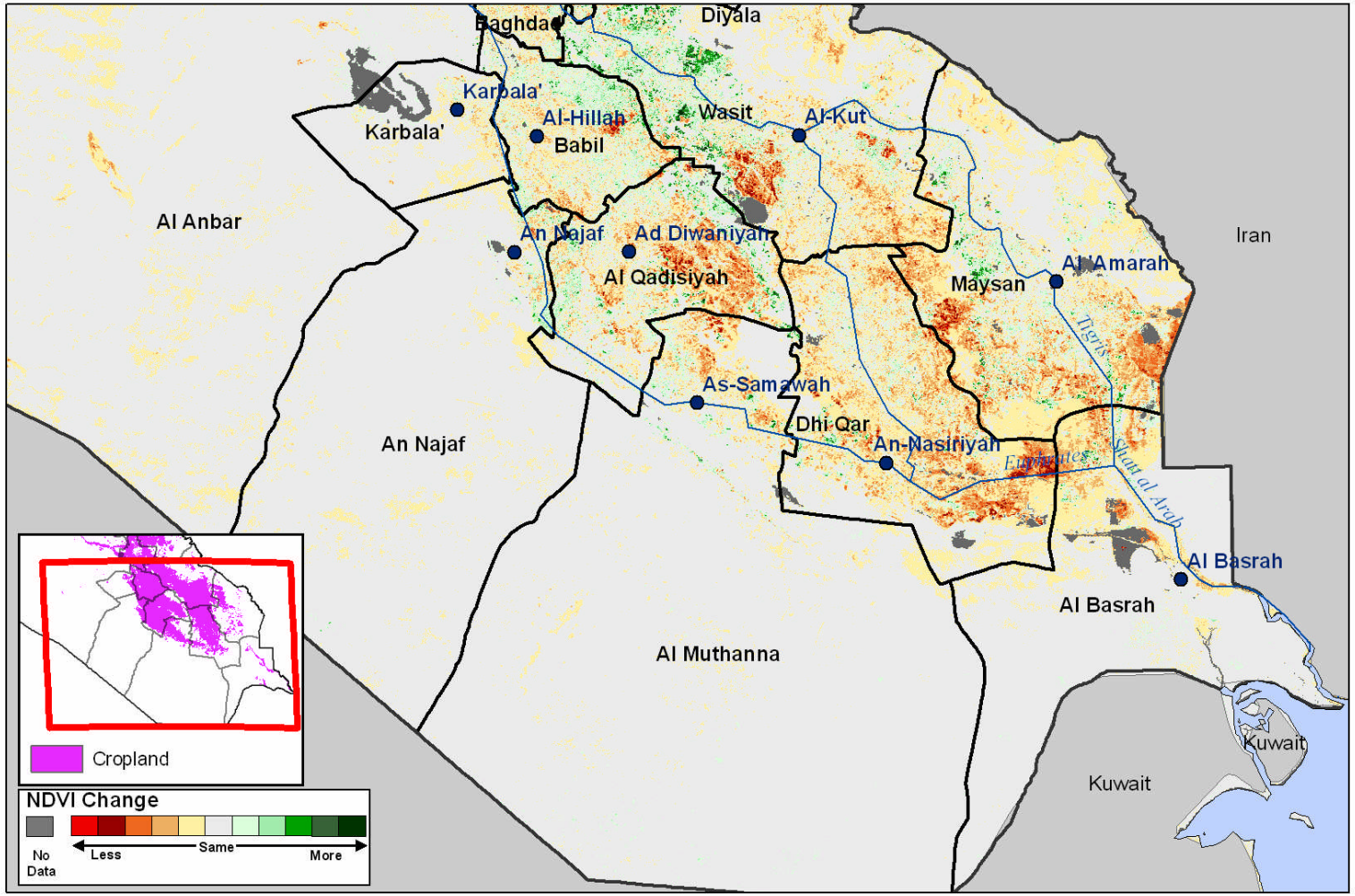
MODIS NDVI Change in Southern Iraq: MY 2010/11 vs. 6 Year Mean



March 6 - 21

Data Source: MODIS 16-Day NDVI
Data Provided by: University of Maryland
Supporting: USDA/FAS/OGA/IPAD

Figure 21. Change in MODIS NDVI for southern Iraq: MY 2010/11 vs. vs. 6-year average. Red box in inset map denotes main scene extent.

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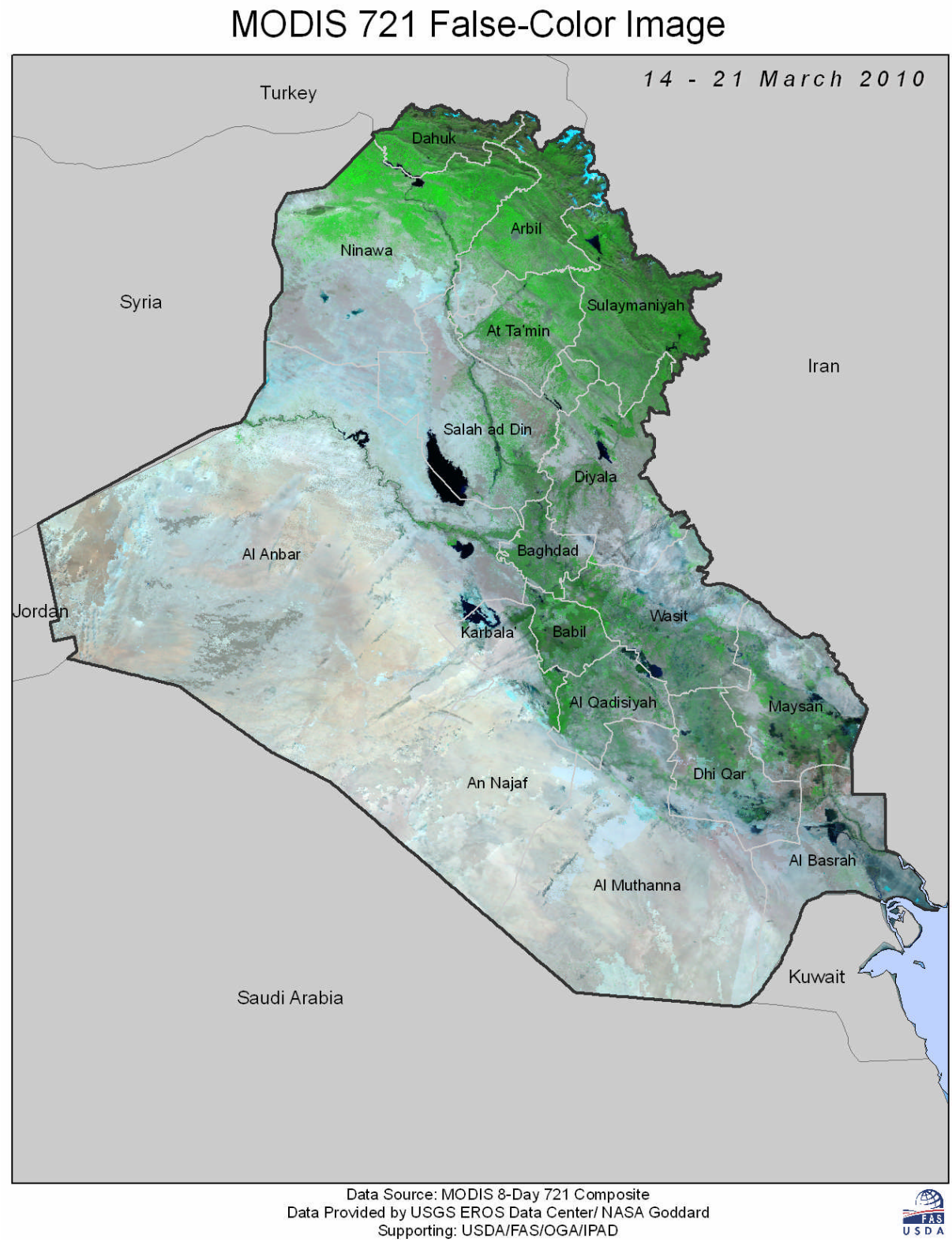

Figure 22. Current month false-color MODIS bands 7, 2, 1 image.

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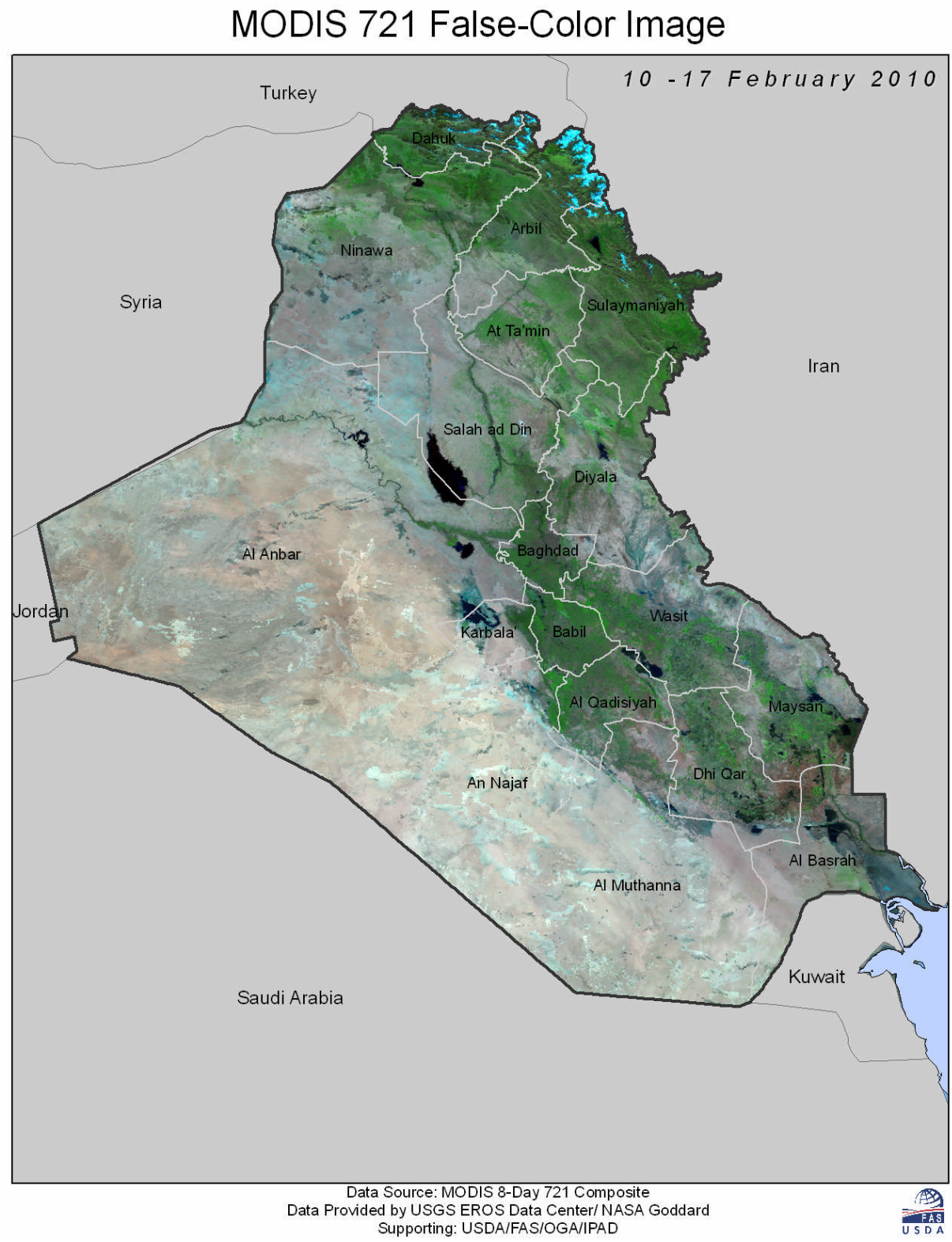

Figure 23. Previous month false-color MODIS bands 7, 2, 1 image.

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Figure 24. Previous year false-color MODIS bands 7, 2, 1 image.

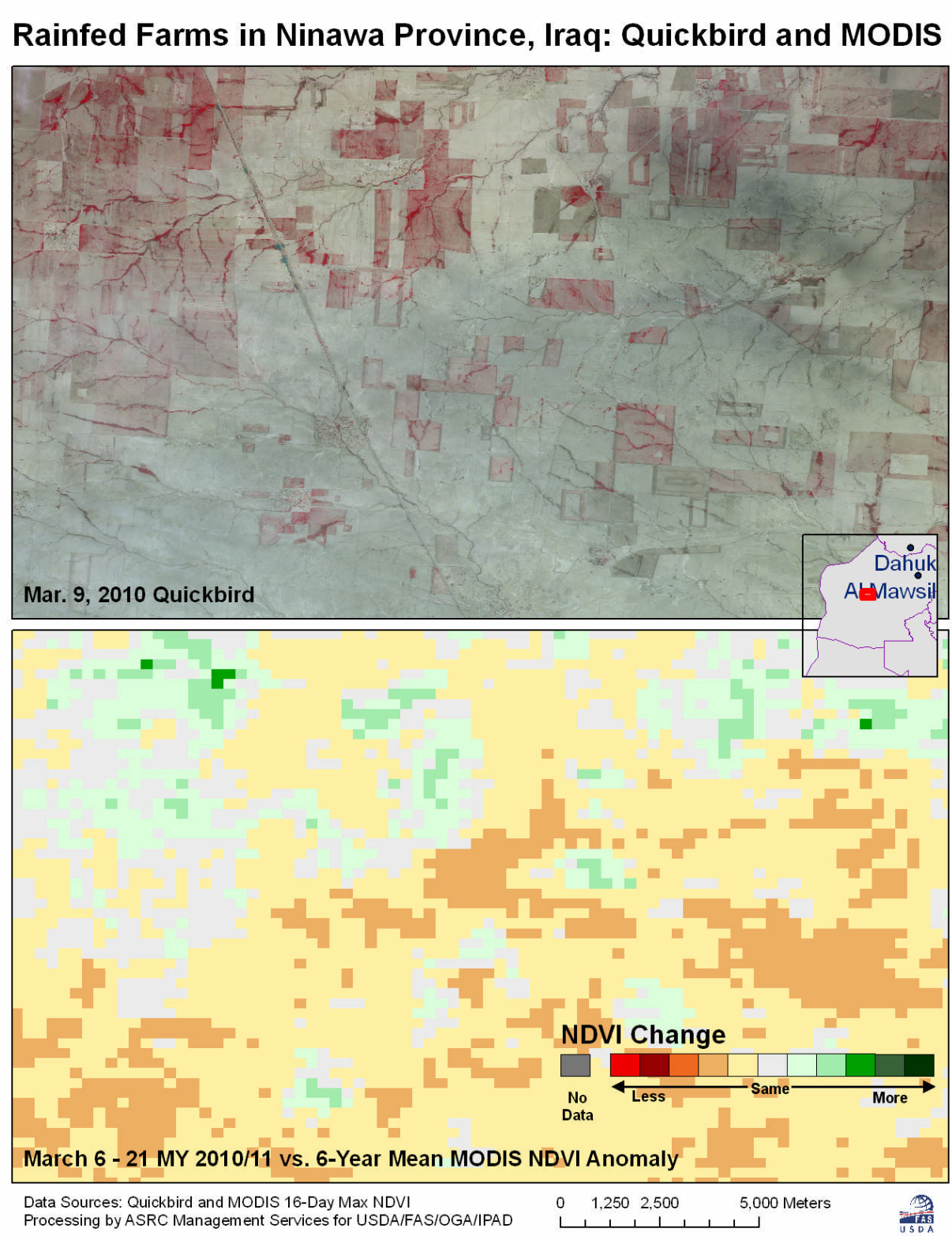

Figure 25. Change in MODIS NDVI for MY 2010/11 vs. MY 2009/10 drought year and current year Quickbird image for Ninawa Province.

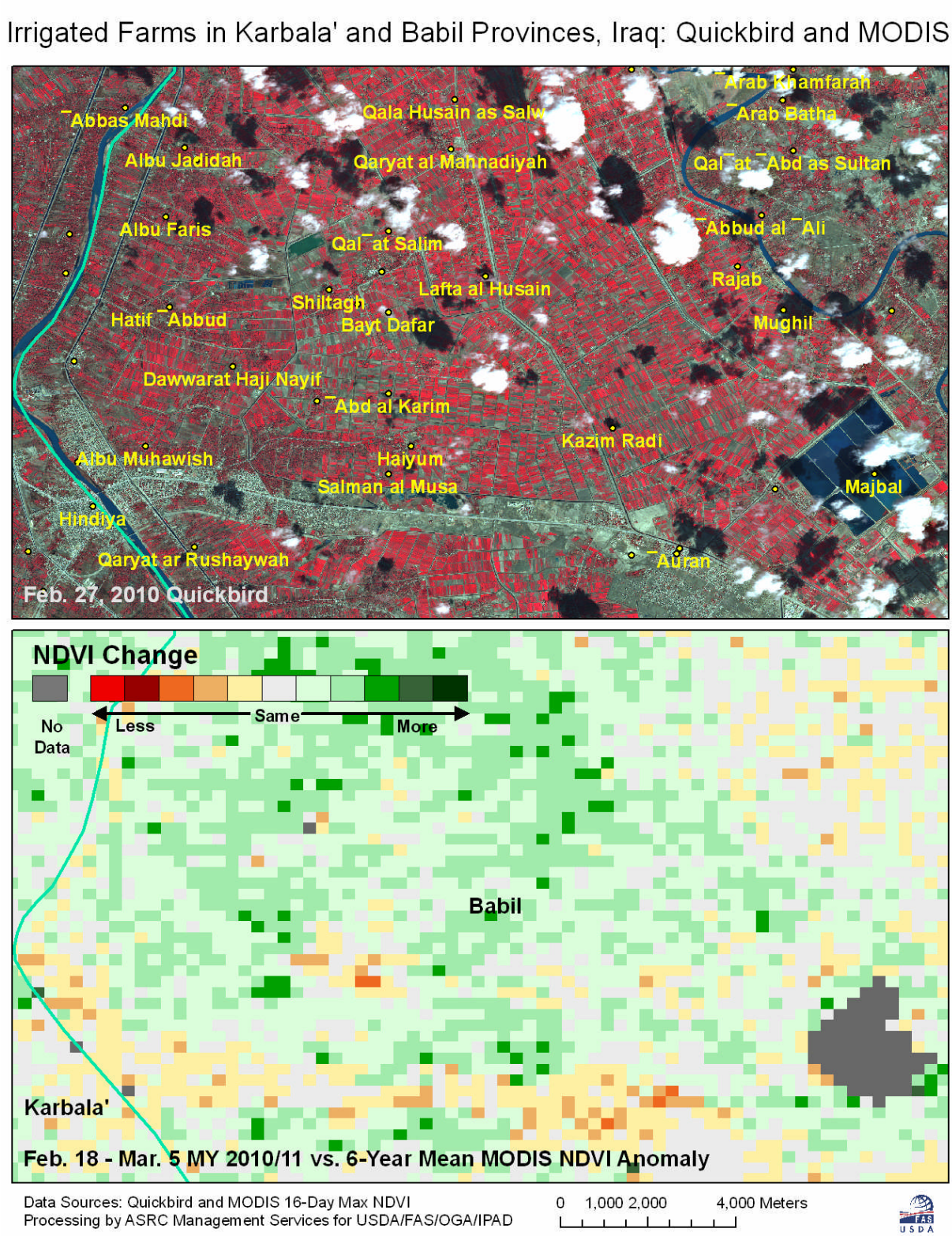

Figure 26. Quickbird and 6-year MODIS NDVI Anomaly images of irrigated crops in the Karbala' and Babil Provinces, Iraq.

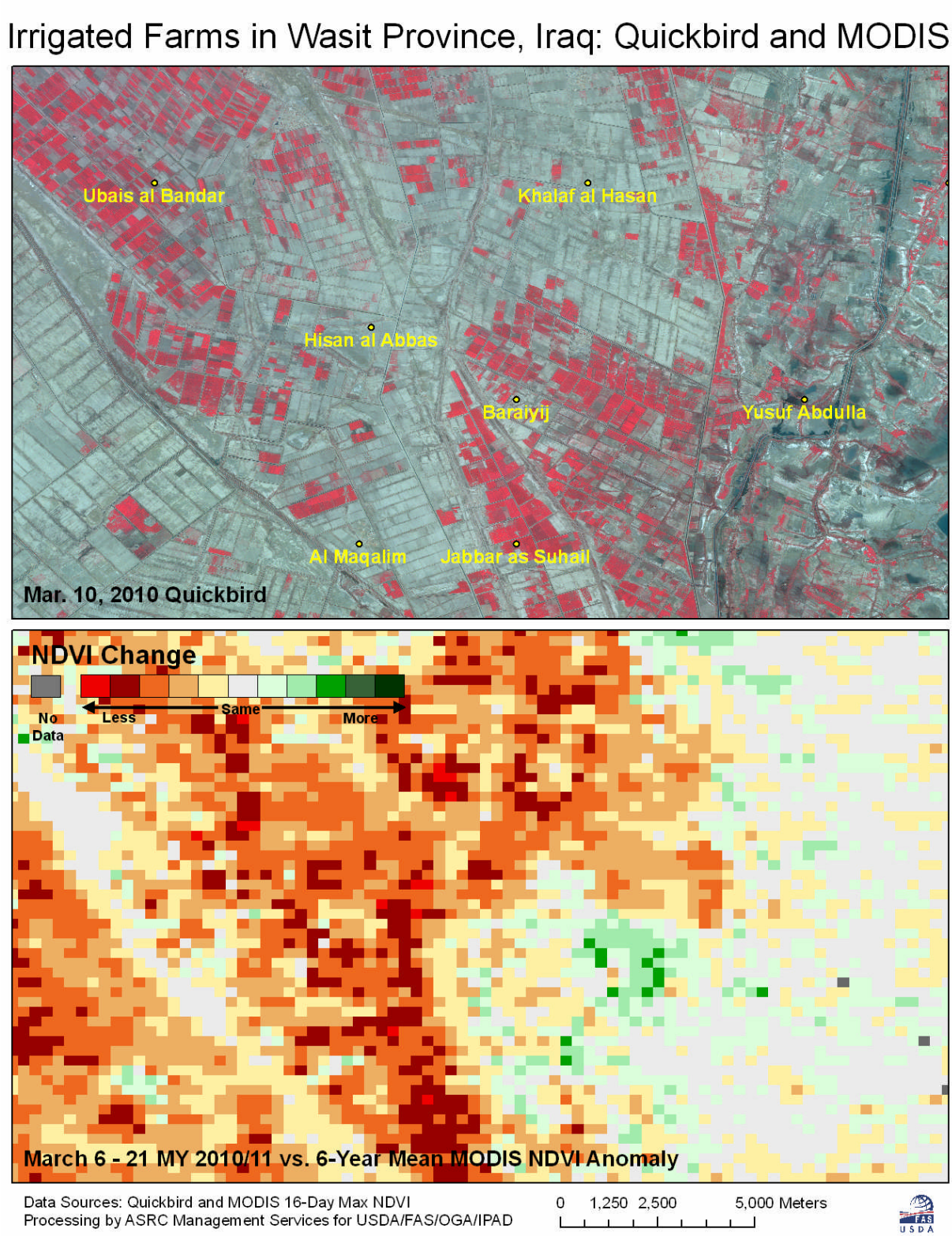

Figure 27. Quickbird and 6-year MODIS NDVI Anomaly images of irrigated crops in Wasit Province, Iraq.

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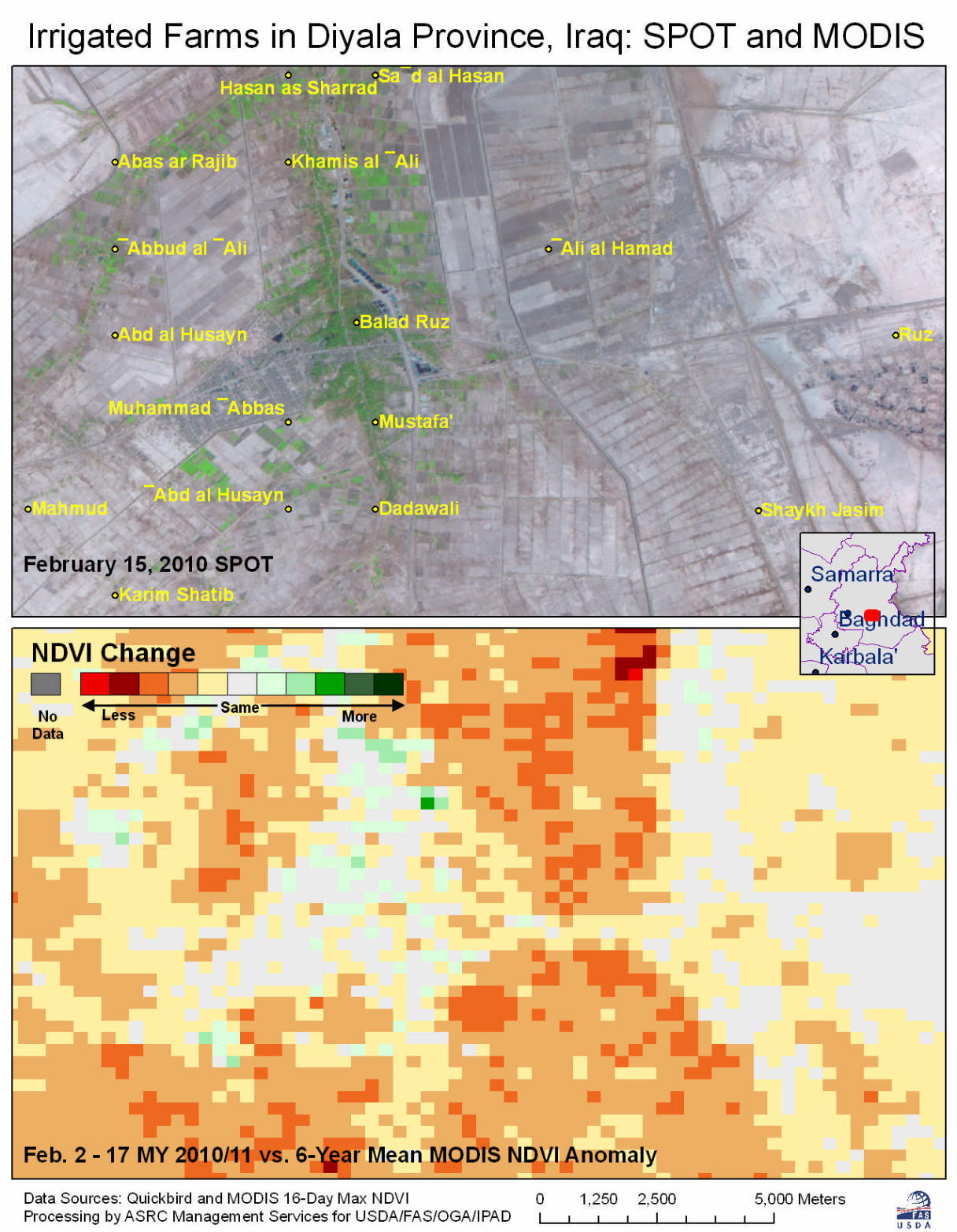

Figure 28. SPOT and 6-year MODIS NDVI Anomaly images of irrigated crops in Diyala Province, Iraq.

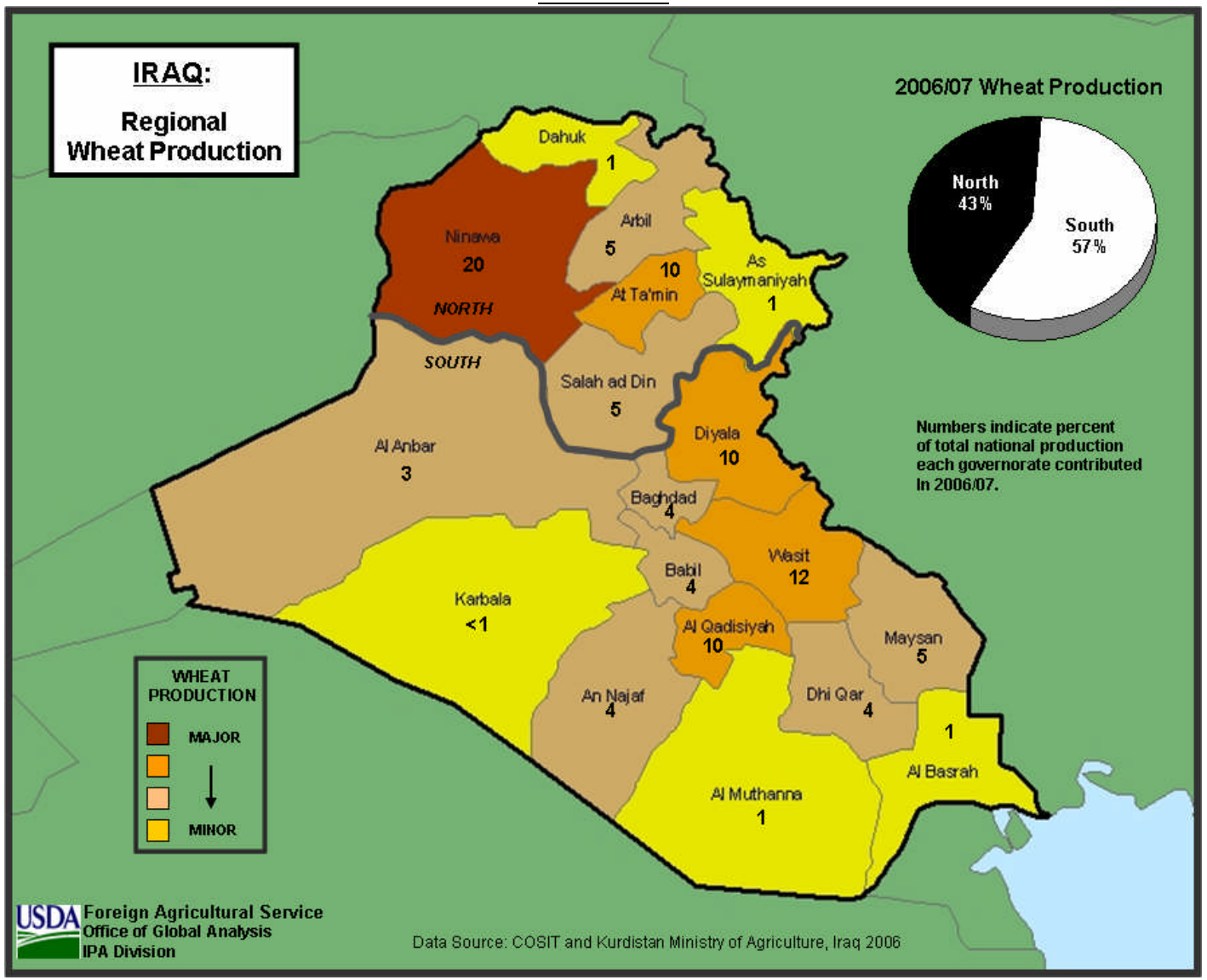

Figure A1. Percent of national wheat production broken down by agricultural region.

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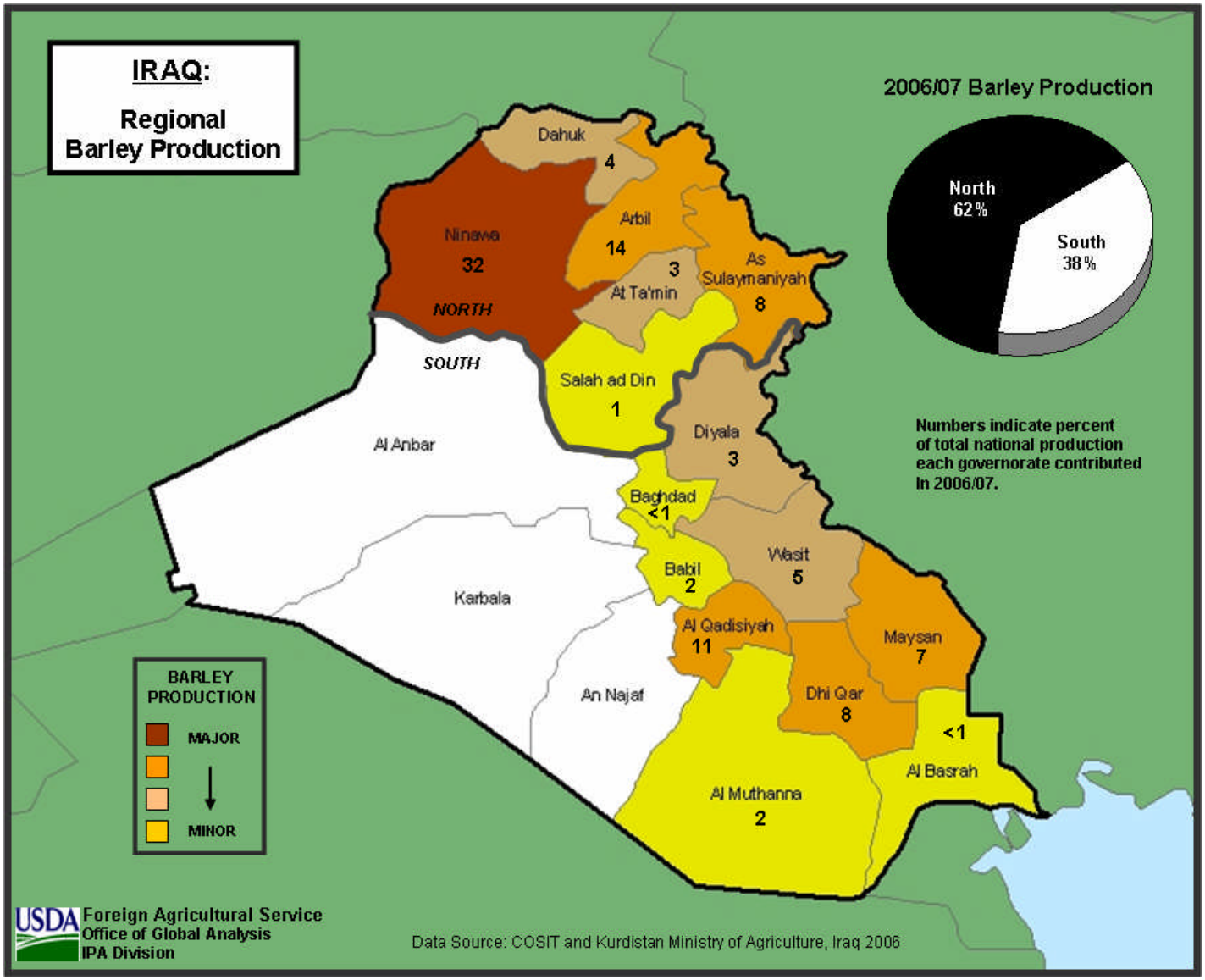

Figure A2. Percent of national barley production broken down by agricultural region.

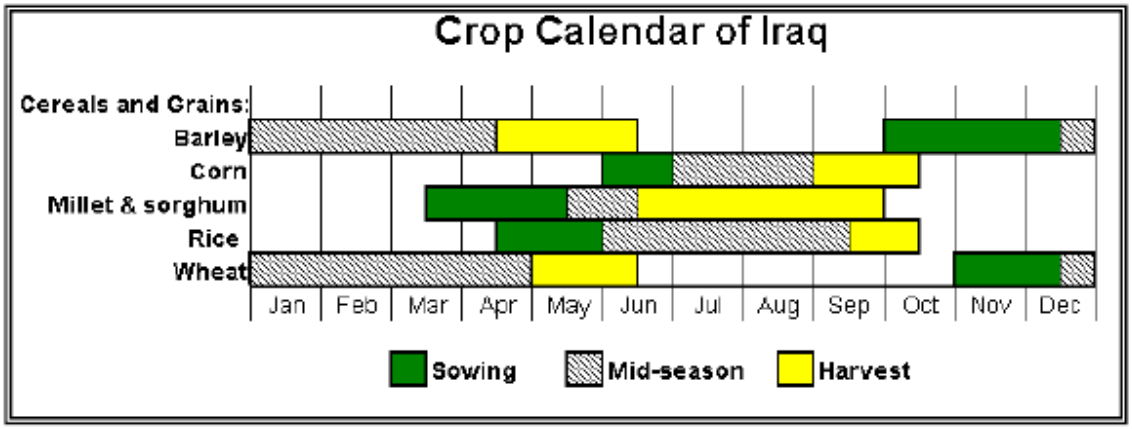

Figure A3. Crop calendar of Iraq.

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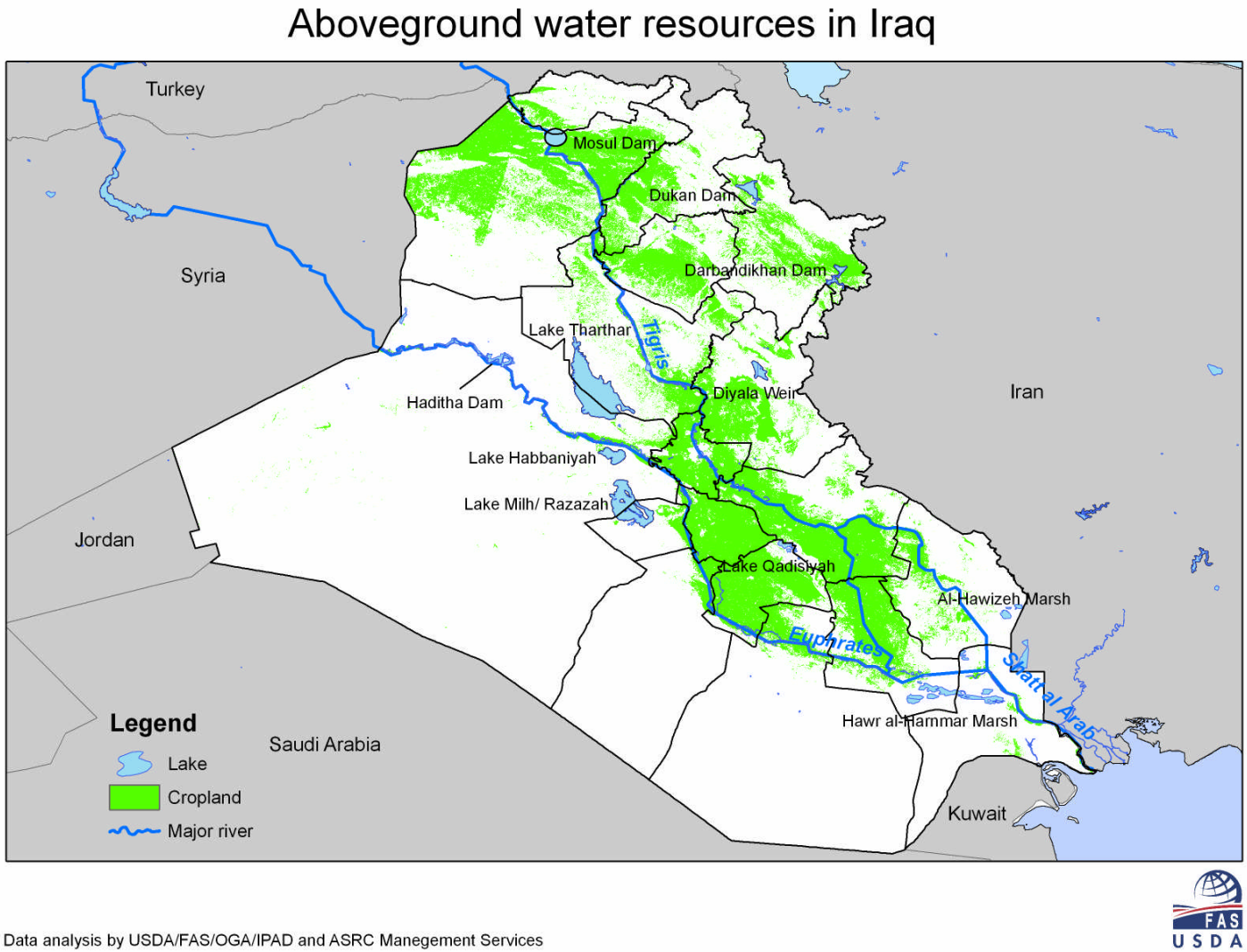

Figure A4. Major lakes and reservoirs in Iraq.

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